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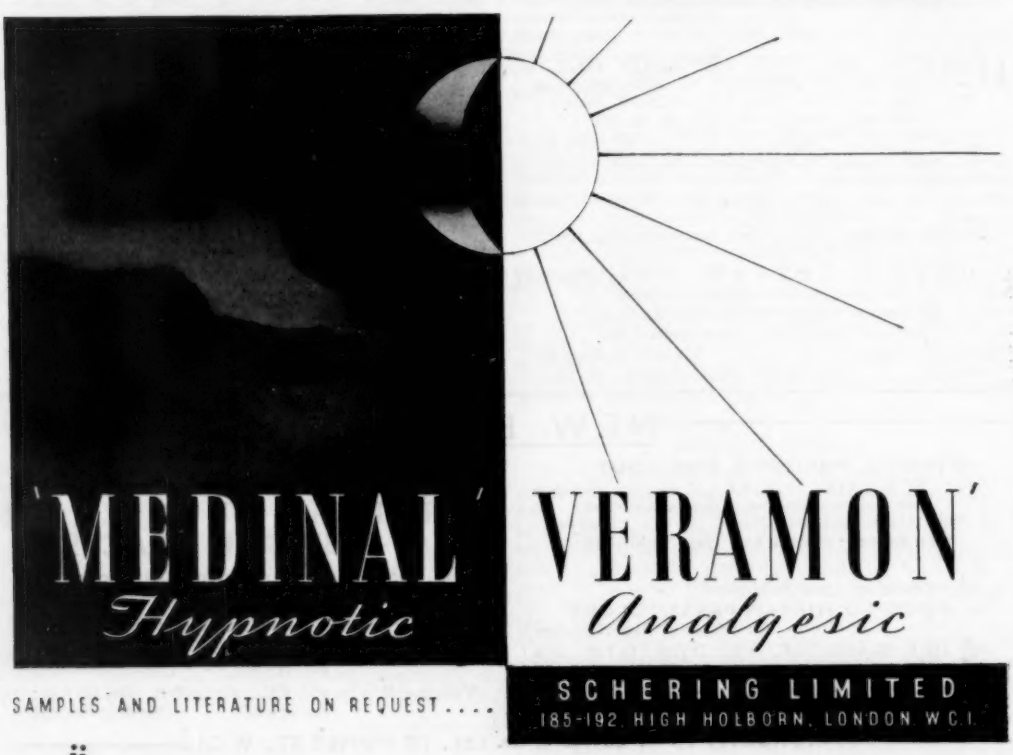

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No. 5993 LONDON: SATURDAY, JULY 9, 1938 CCXXXV

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Seven Gifts. By ROBERT HUTCHISON, P.R.C.P.... 61

Diabetes Mellitus: A Survey of Changes in Treatment during the Last Fifteen Years.—II. By G. GRAHAM, F.R.C.P. (*with charts*) 62

Modern Classified Treatment of Varicose Veins. By P. CLARKSON, F.R.C.S. (*illus.*) 69

The Irritable Bladder of Chronic Cervicitis. By Prof. J. YOUNG, M.D., and A. J. CUNNINGHAM, M.D. 73

Antibacterial Action in vitro of 2-(*p*-Aminobenzenesulphonamido) Pyridine on Pneumococci and Streptococci. By Prof. A. FLEMING, F.R.C.S. (*illus.*) 74

CLINICAL AND LABORATORY NOTES

Thrombosis of Central Vein of Retina Successfully Treated with Heparin. By C. G. BOSTRÖM, M.D., and L. WILLIAM-OLSSON, M.L. 78

Sulphonamides in Malaria. By R. PAKENHAM-WALSH, B.M., and A. T. RENNIE (*with chart*) 79

Effect of Testosterone Propionate on Blood Pressure. By R. GREENE, D.M. 79

MEDICAL SOCIETIES

National Association for the Prevention of Tuberculosis: Antituberculosis Activities in Rural Areas 80

Association of Clinical Pathologists: Medico-legal Post-mortems..... 82

Royal Society of Tropical Medicine and Hygiene: Hæmolytic Macrocytic Anæmia in Macedonia.. 83

North of England Obstetrical and Gynæcological Society: Absence of Vagina 84

REVIEWS AND NOTICES OF BOOKS

Pneumonia and Serum Therapy. By Prof. F. T. Lord, M.D., and R. Heffron, M.D. 85

A Method of Anatomy. By Prof. J. C. B. Grant, F.R.C.S.E. 85

British Encyclopædia of Medical Practice.—Vol. VII. Edited by Sir Humphry Rolleston, M.D., and others..... 85

Phenomenon of Local Tissue Reactivity. By G. Shwartzman, M.D.... 86

The Negro's Struggle for Survival. By Prof. S. J. Holmes 86

The Generations. By E. Miller, M.R.C.S..... 86

LEADING ARTICLES

OLD AGE IN MIND AND BODY..... 87

URÆMIA AFTER TRANSFUSION 88

THE NEW HOSPITALS CENTRE AT BIRMINGHAM 88

STAMMERING 89

ANNOTATIONS

Post-operative Coronary Thrombosis 90

Psychology of A.R.P..... 90

How can the National Diet be Improved? 91

The Myxœdema Heart.... 92

Distortion Injuries of the Knee-joint 92

Intravenous Mineral Therapy 93

Chemical Prophylaxis against Poliomyelitis ... 93

Schistosomiasis of the Lungs 93

Optic Atrophy in Pernicious Anæmia 94

Incubation Period in Undulant Fever 94

Limitation of Opium Production 94

Admission of Austrian Doctors 94

SPECIAL ARTICLES

Planning a Hospital. By Sir HENRY GAUVAIN, M.D., F.R.C.S. (*illus.*)... 95

Medicine and the Law: Artificial Abortion following Rape—Escape of a Diphtheria Carrier.... 99

Maternity and Child Welfare Conference: Psychology of Pregnancy 100

Australasia: Insurance Scheme in New Zealand. 102

Norway: Amateur Psychoanalysis 103

Scotland: The Circulation and Neovitalism 103

Budapest: Minimum Fees 104

THE LANCET 100 Years Ago 115

CORRESPONDENCE

Anahæmin in Tropical Macrocytic Anæmia (Prof. L. Everard Napier, M.R.C.P.) (*with chart*) .. 106

Heart-homes for Rheumatic Children..... 107

Help for China (Prof. Millais Culpin, M.D., Mr. W. C. W. Nixon, F.R.C.S., and Mr. H. J. Seddon, F.R.C.S.) 107

Emergency Beds (Dr. S. Abrahams)..... 107

A "Harmless" Hair Dye (Dr. W. J. O'Donovan).. 108

PUBLIC HEALTH

Dental Caries in Lewis and Parts of West Rossshire. By J. D. KING, Ph.D., L.D.S. (*illus.*)... 109

Infectious Disease in England and Wales 104

OBITUARY

Sir Colin Mackenzie, M.D., F.R.S.E. 108

Hugh Woods, M.D..... 108

Edith Stoney, M.A. 108

GRAINS AND SCRUPLES

From an Aural Surgeon (II) 105

PARLIAMENT

Notes on Current Topics: Government Milk Policy—Still-Births (Scotland) Bill 111

Question Time: The Noise Nuisance—Infantile Paralysis—Family Allowances and Nutrition—Industrial Eye Injuries—Opium Traffic in China—Research in Use of a New Drug—Treatment of Schizophrenia 112

MEDICAL NEWS

University of Cambridge .. 114

University of Liverpool ... 114

University of Birmingham 114

University of Manchester . 114

University of Wales 114

University of Glasgow 114

University of Dublin 114

Queen's University, Belfast 114

St. Andrews University ... 114

Provisional Cancer Council in Ireland 114

Anthropological Congress.. 115

Egyptian Decoration 115

Welsh Board of Health... 115

Questionnaire on the Nursing Profession 115

Lectures on Retarded Children 115

Manchester Royal Infirmary 115

Progress in Kenya 68

Calls to the Bar 108

NOTES, COMMENTS, AND ABSTRACTS

Stammer. By E. N. SNOWDEN, M.B..... 117

"This Mortal Coil"..... 120

Pathological Investigations at the London Chest Hospital 120

The History of St. Helena 120

Prevention of Eye Injuries 84

Medical Diary 115

Appointments 115

Vacancies 116

Births, Marriages, Deaths 116

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CONTENTS

SECTION I
THE HISTORY

CHAP.
1. THE SIX MAJOR SYMPTOMS
2. THE SIX MAJOR SYMPTOMS (*contd.*)
3. MINOR SYMPTOMS
4. THE AUXILIARY HISTORY

SECTION II
PHYSICAL EXAMINATION OF THE CHEST

5. INSPECTION
6. PALPATION
7. PERCUSSION
8. AUSCULTATION

SECTION III
SPECIAL INVESTIGATIONS

9. THE SPUTUM
10. BLOOD EXAMINATIONS—PLEURAL FLUID
11. RADIOLOGY OF THE CHEST
12. SPECIAL DIAGNOSTIC METHODS

SECTION IV
DISEASES OF THE RESPIRATORY TRACT

13. THE NOSE
14. THE MOUTH
15. THE LARYNX
16. THE TRACHEA AND BRONCHI

SECTION IV
(*continued*)

CHAP.
17. ASTHMA
18. BRONCHIECTASIS
19. TUMOURS OF THE BRONCHI
20. CHEST INJURIES—DISORDERS OF THE PULMONARY CIRCULATION
21. EMPHYSEMA
22. COLLAPSE OF THE LUNG
23. PNEUMONIA
24. BRONCHO-PNEUMONIA
25. PNEUMONITIS
26. LUNG ABSCESS
27. PULMONARY TUBERCULOSIS
28. PULMONARY TUBERCULOSIS (*contd.*)
29. TREATMENT OF PULMONARY TUBERCULOSIS
30. NON-TUBERCULOUS CHRONIC LUNG INFECTIONS
31. FIBROSIS OF THE LUNG
32. THE PLEURA
33. "PLEURISY"
34. EMPYEMA
35. TUMOURS OF THE PLEURA
36. THE MEDIASTINUM
37. THE DIAPHRAGM

INDEX

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I must thank you at the outset for the honour you have done me in asking me to distribute the prizes this afternoon. It is an honour, however, which reminds one of the passage of the years for it is usually reserved for grave and reverend persons who have reached an age when, as the cynic said, one consoles oneself by giving good advice for being no longer able to set a bad example. Well, I don't know that I have much belief in giving good advice—especially if it is gratuitous—so instead, and yet by way of improving the occasion, let me ask what gifts, were I a good fairy (supposing you to be capable of that flight of imagination), would I bestow on anyone setting out on a medical career? By that cunning approach I may be able to slip in some good advice without your noticing it.

Well, in the first place I would give him *good health*, for medicine—and it is one of its glories—is a dangerous profession and there is nothing so tragic, as Bernard Shaw has said, as the sick doctor. But the kind of good health I would give is not what is commonly understood by that stupid word, so much overworked at present, "fitness." Not the athlete's type of health but that sort of wiry constitution which is able to resist fatigue and infection and which—and this may be comforting to some of you—often goes with quite a poor physique. You can't acquire that constitution, you have to be born with it and there are no rules, despite the health cranks, by which you can attain it and if there were the conditions of your work would not allow of your following them. There are, of course, many ways in which health can be ruined—but you know them as well as I do.

Luckiness would be my next gift, for I am convinced that pure luck is one of the chief factors making for happiness and success. Luck in your background, in your home and parents; luck in your choice of a medical school—and you have all been lucky in choosing the London; luck in examinations and in appointments becoming vacant just when you want them; luck in falling into a good practice; luck in your partner and, above all, luck in your wife. Some men owe all, or nearly all, their success to luck, but if you have it not remember that hard work and patience can make up to a great extent for the want of it.

Then I must bestow some *brains*—but not too many. It is unnecessary—perhaps dangerous—in medicine to be too clever. On the other hand don't suppose that brains are of little account. It is customary on occasions like this to say that prize-winning doesn't much matter and that the man who only scrapes through exams often does as well as the prizeman in the end. Believe me that is cant. Other things being equal the man who does well at examinations does best in after-life and it is dishonest to pretend otherwise. But if I had not many brains to bestow I should make up for it by an extra gift of *diligence*. The faculty of steady work, unhasting and unresting—not merely a rush of it just before examinations—will compensate for almost any lack of cleverness, and although it comes to some naturally it is within the power of anyone to acquire. If then it is not born in you see that you attain it here.

My next gift would be *equanimity*—the *mens æqua in arduis*—the power, as Kipling said, "to turn a keen untroubled face home to the instant need of things." There is no quality of mind more essential to you as doctors for you will often have to face sudden and disconcerting emergencies and a fair share of it will also do much to preserve you from the corroding effect of those worries which are unescapable in practice. But let me comfort those of you who have been born anxious-minded, natural worriers, and with temperaments far from equable by saying that time and experience tend to produce a degree of equanimity in most of us. A distinguished judge once said that for the first ten years he was on the bench he was always worrying whether his judgments were right, for the next ten he was always sure they were, and after that he didn't care whether they were or not. But perhaps that is to confuse equanimity with indifference, which is not by any means the same thing.

Having then endowed my student with good health, luck, a fair share of brains or the power of hard work, and an equable temperament what does he yet lack? Well I have still three gifts in reserve, each of the greatest importance, gifts of character perhaps more than of intellect and they are these—a sense of justice, a sense of beauty, and a sense of humour, and I am not sure that these three gifts are not worth all the others put together.

A sense of *justice* in the first place to your patient, so that you will always give him a fair deal, not scamping your investigation of his case and rendering him always full value for your fee. This means, too, that you must make it your duty to keep abreast of the advances in medical knowledge, for it is unjust that your patient should not have the benefit of them.

Justice also to your professional brethren, so that though you enter into honourable rivalry with them you take no unfair advantage and are slow to believe what you hear to their discredit. In the stress and competition of professional life such justice is not always easy. And lastly a sense of what is just to yourself and to your profession, seeing to it that you are not exploited but that you get a due reward for your work and that the dignity of medicine is properly respected in your person.

But a sense of justice is an intellectual as well as a moral quality and it will help to make you a skilled healer of the sick, for diagnosis is the major part of medicine and the art of diagnosis consists largely in giving due and just weight to each of the symptoms and signs that your patient presents. It is an exercise of the judicial faculty.

A sense of *beauty* you may think rather a luxurious gift for a doctor, but it is not really so. There is much in a medical life that is ugly and sordid. When you hear someone say that he has just seen a "lovely" case of lupus, or rodent ulcer or cancer, he is not to be taken literally. Disease is ugly and many of you will be condemned to fight it in ugly surroundings—amidst the mean streets of a manufacturing town perhaps, or in some sordid suburb. You will need a sense of beauty as a compensation and a way of escape; as a sanifying and steadying influence. It will not take the same form in all of you. Some will

* An address delivered to students at the prize-giving of the London Hospital Medical College on June 30th.

find their refreshment in art, others perhaps in music, and happy are those of you who are able to practise either of these even in the humblest way. In others literature will be a refuge—both current literature and those great masterpieces of prose and verse which are beyond the influence of fashion and are untouched by time. I would urge you therefore not to allow your professional reading to crowd out general literature altogether. Take to heart the warning of Darwin, who deplored in his later life that he had quite lost his earlier taste for poetry. So close-linked too are language and thought that the cultivation of literature will make you think more clearly and express yourself, even in your professional writing, more accurately, and confused thinking and slovenly writing are, alas, all too common in our profession.

There may be some, however, to whom the fairy godmother has given no appreciation of art or music or literature but who find their escape in the enjoyment of natural beauty. These are perhaps most to be envied and happy are such if their lot is cast in a country practice.

I confess that in moments of gloom I am sometimes tempted to think that beauty has in these days fled from the haunts of men. For myself I can find little of it in present-day painting, architecture, music, or poetry, and even the fair face of nature is being daily defiled but that may be the view of a confirmed Victorian. Every generation has to find beauty in its own way and to you younger men there may be loveliness where we older people cannot see it.

My last and best gift would be a sense of *humour*. Fortunately most of you are likely to have been given this in fair measure, for humour is an essentially Anglo-Saxon quality; it is not met with much in the Celts, the Latins, or the Teutons. If you come from anywhere between the Highland line and the Humber your sense of humour is probably of a dry quality which, like extra-dry champagne, is not universally appreciated, but as one proceeds south it becomes more mellow. You may think it curious that humour should be a valuable gift for a doctor to possess, but I assure you it is so. It will help you to bear with the vagaries of your patients and still more with those of their relations and to derive amusement instead of annoyance from the eccentricities of your colleagues. Humour will save you also from two great besetting sins of the doctor—faddery when he is young, pomposity when he is old—for if you have a sense of humour you will often hear the still small voice within you which at the critical moment whispers "humbug." It will prevent you also from taking yourself and your work too seriously and will remind you that there are other things in life worth having besides health. The world just now badly needs a sense of humour, for if it were more widespread the prancing and posturing of Dictators would be impossible. Humour, however, is a gift which is not to be cultivated in solitude, so if you wish to develop it in yourself you must mix with your fellows and take your part in all the activities—intellectual, social, and athletic—of such a College as this.

That, gentlemen, concludes my list of gifts, but armed especially with the last three—a sense of justice, of beauty, and of humour—you will be able to face with equanimity all the buffets and disappointments, all the weariness and ugliness which your lives as doctors may have in store for you. And now, in the words which I have to address to every new fellow of the Royal College of Physicians, I wish you "all happiness."

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Some of these patients never have hypoglycæmic attacks, or if they do the attacks are mild, easily recognised, and cause no real inconvenience. The condition may tend to improve so that in some cases the insulin can be abandoned, or it may remain stationary, but it is liable to temporary upsets which can be traced to specific causes like illnesses, or injuries. If the dose of insulin is increased sufficiently as soon as the glycosuria and hyperglycæmia occur the diabetic condition may not be aggravated, and the dose of insulin may decrease again to the original level.

The dose of insulin which patients of this type require may be very large.

In November, 1936, Dr. R. O. Jones of Amlwch, Anglesey, brought A. B., a woman aged 35, to see me. Eight months previously she had had an acute onset of diabetes. This was easily controlled with 10+10 units on a diet containing 100 g. of carbohydrate. In September, 1936, she had an attack of diarrhœa and vomiting which made her very ill and the insulin was increased to 60+60 units, but the blood-sugar was never less than 200 mg. per 100 c.cm. and the urine always contained sugar. By November her weight had decreased by 37 lb. and she looked ill. A routine examination at this stage revealed the presence of many enlarged hard glands in the groins, which the patient then admitted had been present for two months, and many small soft glands in the axillæ. The spleen was not enlarged. At this stage I saw her in consultation. She was very thin and looked unwell but apart from the glands there were no abnormal physical signs. The blood-sugar was 300 mg. at 11 A.M. in spite of 60 units of insulin 2½ hours previously. The urine contained much sugar and acetone bodies. I persuaded her with difficulty to come into a nursing-home as she denied that she was unwell, though she subsequently admitted that she had felt very tired. There was no pyrexia and the blood count was normal. The radiogram of the chest showed nothing abnormal in heart or lungs. A gland was removed from the groin but only showed a lymphadenitis. These examinations excluded the diagnosis of lymphadenoma and lymphatic leukæmia. After a consultation with Dr. R. A. Rowlands the diagnosis of glandular fever was made. (If this was the case, the start of the infection must have been in August. I had once before seen a youth whose insulin requirements had been increased from 20 units to 80 units by a very mild attack of glandular fever.) While these investigations were being made the carbohydrate of the diet was raised to 150 g. and the dose of insulin was increased rapidly as every specimen

* The Lettsomian lectures delivered before the Medical Society of London on Feb. 21st, March 2nd and 7th. Lect. I appeared in THE LANCET last week.

of urine contained sugar and the blood-sugar was usually between 250 and 330 mg. per 100 c.cm. It was necessary to give three doses a day, but the maximum dose given was 180+80+100=360 units (Fig. 10). It was easier to control the blood-sugar during the night but when the urine at 8 A.M. contained little or no sugar it required courage to give 180 units, and when the tests at midday were clear on the 12th day I was alarmed and decreased the dose by 60 units, but the next day had to increase again by 100 units. The patient left the nursing-home after three weeks feeling very much better taking 190+20+100 units=310 units and passing very little sugar in the urine. Shortly after this she developed influenza during the epidemic of January, 1937. Dr. Jones had to increase the dose of insulin to 226+120+132=478 units to get the urine sugar under reasonable control. A little while later she had another bout of pyrexia for which she was given quinine, and ever since the dose of insulin has been steadily decreasing. I saw her again a year after her first visit. She looked well and as a rule only needed 36+36 units. The glands were still present but were slightly smaller.

Patients are usually disturbed when they are given large doses of insulin and I am in the habit of telling them the following story:—

Some years ago I was looking after a Jewish banker who, like many of his race, was a little nervous about his health. For some unexplained reason his insulin requirements rose to 106 units, and in spite of a careful search no cause could be found. This rise in the insulin dosage worried him greatly and two mornings running the following conversation occurred: Patient: "I do not like taking so much insulin! How much can one take?" Answer: "As much as is necessary; there is no limit." Patient: "In my profession of banking there is always a limit." Answer: "I know there is in banking, but in diabetes the limit is the sky, and a patient must have as much as is necessary." This conversation satisfied him, and he lived another eight years and usually only needed about 40 units a day.

PROGRESSIVE CASES

So far I have spoken of the disease which gets better, remains stationary, or is disturbed temporarily by other illnesses, but there are unfortunately many cases in which the disease progresses. This may occur early or after the disease has seemed mild for several years. The patient may pass sugar before one or other or both doses of insulin, and when the dose of insulin is increased to prevent the hyperglycæmia he may suffer from hypoglycæmia either at midday or during the night. The condition bears no relation to the size of the dose of insulin for the symptoms may occur with quite small doses like 10+8 units or with large doses, 60+50 units or more. It seems to be due to two factors: (1) the insulin acts more quickly so that the blood-sugar decreases rapidly; (2) the effect of the insulin on the blood-sugar no longer lasts 10–12 hours, but only 8–10 hours. The change may be most marked in the daytime or during the night. This is well illustrated by the following case:—

A man aged 45, who usually failed to recognise the symptoms of hypoglycæmia, was in a nursing-home for treatment of a tuberculous ischio-rectal sinus which had nearly healed. He always passed a great deal of sugar before breakfast and up till 12 noon. One morning the blood-sugar was 130 mg. per 100 c.cm. at 7 A.M. which seemed very satisfactory, but by 7.30 it had risen to 230 mg. Forty units of insulin were given at this time, 1½ hours before breakfast, in the hope of controlling the blood-sugar, instead of the usual half-hour. In spite of this big dose the blood-sugar continued to rise and was 240 mg. per 100 c.cm. half an hour later, but had fallen to 190 and 180 mg. 1 and 1½ hours after the insulin. A breakfast containing 30 g. of carbohydrate caused a slight rise but the blood-sugar at 1 P.M. had decreased to 70 mg.

I have made estimations of the blood-sugar in some cases when it was 300 mg. before breakfast, 40 mg. before the midday meal, and over 300 mg. before the evening meal. These cases which have been called "insulin wasters" are difficult to look after and I shall refer to them in my third lecture when I am speaking of the new insulins.

Phenomenon of "Insulin Resistance"

An important type is that called "insulin resistant." In the extreme cases very large amounts of insulin are given without producing any effect on the blood-sugar. Allan and Constam (1929) report having had to increase the dose of insulin to 500 units a day before they controlled the glycosuria. Root (1929) gave 1600 and finally 1680 units in the last three days of life without preventing death in coma. Both these patients had hæmochromatosis and the liver was practically destroyed. In the less severe cases 200 to 400 units may be required before any effect is produced, and in these cases it is impossible to detect any signs of disease such as were present in the case I have already described. I have learnt a good deal from a case I saw some years ago.

The patient was a woman, aged 60 in 1933. I first saw her in 1925 and was then told that she had had diabetes for some years, but had never had any real symptoms of thirst or polyuria. At that time she was only eating about 45 to 50 g. of carbohydrate and the blood-sugar in the middle of the morning was 180 mg. per 100 c.cm. I thought she would be better with insulin but she refused to have it. I next saw her eight years later, and was told that she had kept to the same rigid diet and also had had many other ailments and a doctor for each ailment: (1) an infected antrum, (2) an infected gall-bladder, (3) an infection of the urinary tract, (4) an X ray burn, (5) a degeneration of the myocardium which necessitated her being in bed most of the day. I was told that the burn still caused trouble but that the other diseases were not active, also that her general health had become much worse in the last few months. The diet only contained about 40 to 50 g. of carbohydrate and a very small amount of protein and fat. The urine contained about 5 per cent. of sugar and much acetone bodies. The blood-sugar was 230 mg. per 100 c.cm. about 5 P.M. I urged her to start insulin as this would enable her to have more food and would benefit her general health. She was very unwilling to do this, her nurses opposed it strenuously, but her doctor succeeded in overcoming her objections. A further difficulty was the local reactions to insulin which developed. However, after trying four brands of insulin one was found which

TABLE I

Date.	Units of insulin.		Carbohydrate (grammes).	Blood-sugar (mg. per 100 c.cm.).	Sugar in urine (per cent.).
	A.M.	P.M.			
July 21st	—	—	50	230	++
„ 22nd	10	5	90	—	—
Aug. 2nd	—	—	—	—	5·0
„ 8th	—	—	—	—	5·0
„ 14th	23	21	90	240	—
„ 18th	—	—	—	—	2·6
„ 26th	—	—	—	—	3·0
„ 27th	44	42	—	—	—
„ 28th	36	36	—	230	3·5

caused the minimum of discomfort. The insulin was steadily increased to 44+42 units. Each specimen of urine was tested but sugar was always present in fair amounts as the Benedict's test was yellow or red, except on one occasion when it was green (Table I). The percentage of sugar decreased from 5 to 2·6. The amount of acetone bodies decreased and none was present after three weeks. Her doctor was certain that her strength had improved although both the patient and her nurses denied it. At this stage she felt unwell before lunch and ascribed it to the insulin. I saw her that afternoon and as the blood-sugar was 230 mg. per 100 c.cm. I was rather incredulous (I now think wrongly) about this. She was anxious to give up the insulin and it was with great difficulty that she was persuaded to continue to take 36+36 units.

The cause of this resistant condition, in which a patient can take 82 units without lowering the blood-sugar although the urinary sugar was slightly decreased, is difficult to understand.

THEORIES BASED ON EXPERIMENTAL WORK

Falta and Boller (1932) have made some interesting observations which have some bearing on insulin resistance.

They gave insulin three times a day to healthy adults on an ordinary normal diet, and observed the amount of insulin which could be given before any signs of hypoglycæmia occurred. The figures for the healthy patients varied from 15 to 120 units, while those for the patients who had in addition a renal glycosuria varied from 40 to 180 units (Table II).

TABLE II

Type of case.	Cases.	Insulin dosage producing symptoms of hypoglycæmia.
Healthy adults	12	15–120
Patients with a fever	4	30– 90
Patients with renal glycosuria	3	40–180
Patients with jaundice ..	4	75–180

The figures for the patients with fever and jaundice would be more interesting if those on recovery had also been given. The figures for the healthy patients are sufficiently remarkable when it is remembered that some diabetic patients who are recovering complain of hypoglycæmic attacks even when the dose of insulin has been reduced to 3 units.

These observations suggest that some interfering substance is present which neutralises the insulin but that the usual effects are obtained if sufficient insulin is given.

Boller, Uiberrak, and Falta (1934) have made some further experiments.

They injected 30 to 40 units of insulin into (1) healthy controls, (2) patients sensitive to insulin, (3) patients insensitive to insulin. Thirty minutes later 300 c.cm. of blood was withdrawn and given to diabetic patients of the same blood group who were sensitive or insensitive to insulin. The blood from the normal person and from the insulin-sensitive patients caused a good decrease of blood-sugar in the insulin-sensitive patients, but a very slight decrease in the insulin-insensitive patients. The blood from the insulin-insensitive patients caused very little decrease in the insulin-sensitive patients and none at all in the insulin-insensitive patients.

The results of these experiments suggest that the antagonising substance is present in the blood. Himsworth (1933) has made a series of important investigations, estimating the difference between the venous and capillary blood of patients during sugar-tolerance tests and in curves caused by the intravenous injections of crystalline insulin. The difference between the capillary and venous blood curves suggested that insulin, whether secreted endogenously or artificially prepared and injected, is inactive. Himsworth put forward the theory that insulin is activated in an autocatalytic reaction with an unknown factor which behaves as a kinase, and that this substance is made in the liver. He points out that Mann and Magath's (1922) experiments on a dehepatised dog have an important bearing on this point.

They found that during the first few hours after the liver has been removed the animal develops spontaneous attacks of hypoglycæmia. If these are treated with intravenous injections of glucose the animal recovers and after some hours spontaneous hypoglycæmia ceases. These attacks are probably caused by the insulin produced in the pancreas for they do not occur when the pancreas is also removed. Injected insulin has its usual effect for about six hours but after this time ceases to have any effect on the blood-sugar (Markowitz, Mann, and Bollman 1928–29).

These experiments suggest that the liver is in some way necessary for insulin to store sugar in the muscles as glycogen, and according to this hypothesis the liver of the insulin-insensitive patients fails to activate the injected insulin. It is possible that other factors play a part in this process. The importance of the liver is demonstrated by Falta and Boller's (1932) observation on four patients with jaundice, who needed 75 to 180 units before having hypoglycæmia. I have already mentioned that the insulin requirements were increased by 100 units in some patients with jaundice. Alcohol may also cause a great increase in the insulin demands. If the patient who has drunk much whisky will abstain from all alcohol, the insulin requirements will decrease very much, whereas a return to alcoholic excess again increases the insulin dosage. These observations all confirm the view that the liver plays some important part in the insulin sugar mechanism and it seems probable that the kinase which Himsworth postulates is made in the liver.

Pfleger and Schall (1937) have recently made some observations on the relation of ascorbic acid to insulin.

They found that many of their diabetic patients were not "saturated" with ascorbic acid given by mouth until they had been given 1500 to 2500 mg., whereas a healthy man who is saturated with ascorbic acid will excrete 90 to 100 per cent. of the test dose on the first and second days. Patients with mild diabetes, who were passing small amounts of sugar, were then saturated with ascorbic acid. No change was noted in the sugar output but the excretion of aceto-acetic acid decreased. When the same experiment was carried out on patients who needed insulin the results were very different. The patients were given a dose of insulin sufficient to reduce the daily excretion of sugar by from 3–25 g. When the conditions were fairly stable the ascorbic acid was given and the glycosuria either ceased altogether or was considerably decreased, and in some cases the dose of insulin was reduced by 10 or 20 units. When the ascorbic acid was withheld the glycosuria increased again. The experiments on healthy individuals showed the same relation to the natural and the injected insulin, since the sugar-tolerance curves were unaltered when the patients were given large amounts of ascorbic acid. When the insulin-depression curve

was carried out it was 20–35 mg. lower after the patients had been saturated with ascorbic acid.

These observations have not yet been confirmed but they suggest that other factors play a part in enabling the injected insulin to deposit the glycogen in the muscles.

Personal Observations on Patients

It is important to consider what is happening to a healthy person who can tolerate 100 units a day without developing hypoglycæmia. Does he have to produce this amount of insulin over and above that which an insulin-sensitive subject requires? Further, what would happen to this man if he developed a diabetes? Would he straightway require more than 100 units before the blood-sugar could be controlled? I can best answer this question by relating a case which has always puzzled me profoundly.

I first saw the man, then aged 61, in 1924. He had been unwell, was losing weight, and had a slight thirst. The urine contained sugar and the blood-sugar was raised. He was given no food for one day and the diet was gradually increased to 50 g. of carbohydrate. but the glycosuria did not disappear and the blood-sugar was still 225 mg. per 100 c.cm. He unwillingly consented to try insulin, but developed local reactions which were so severe, with B.W. and Eli Lilly insulins, that he refused to have any more. He kept to a diet containing very little carbohydrate, only 25 g., but the blood-sugar remained at 220 mg. per 100 c.cm. In December, 1927, he was given Synthalin, 10 mg. b.d., and Decholin, 25 mg. b.d. These were taken in three-day periods with one day's interval. During the next year he was better and the blood-sugar was once as low as 160 mg. per 100 c.cm. After two years treatment with synthalin was abandoned, as he was troubled with diarrhœa. He was persuaded to start insulin, but had a local reaction as before. On the second day he had an alarming experience five minutes after the injection. He sneezed violently, developed swelling of the eyelids, and vomited twice. On going to bed he found that his legs were covered with urticarial weals. He was very ill for about eight hours, but had recovered the next day. On giving him an intradermal injection of 0·1 c.cm. of insulin a very large urticarial weal appeared and I suspect that he had unintentionally given the insulin intravenously. On testing his skin with the different insulins the B.W. brand gave him the smallest weal and this was a little smaller than that of B.W. crystalline insulin. He was admitted to hospital and desensitised with B.W. insulin, starting with a dose of 0·05 c.cm. of 1 in 200 B.W. insulin. Six injections were given each day, and after six weeks he was able to take undiluted insulin but needed 32+28 units to keep the blood-sugar within normal limits for a diet containing 60 g. of carbohydrate. During the next three years his general health improved very much and the carbohydrate of the diet was increased to 124 g. and the insulin to 46+46 units, and the blood-sugar was usually normal. Since then the insulin has been reduced to 36+36 units as the blood-sugar was low but he has never had any signs of hypoglycæmia. He has always been anxious to give up insulin but I have always persuaded him to keep on with it.

I decided to see what would happen to him if I stopped the insulin. He was admitted to hospital for observation and the skin was tested out with the following brands of ordinary insulin—B.W., Boots, Leo, and with Retard and A.B. protamine zinc. The skin reactions were well marked but no greater than the weal caused by 1 minim of normal saline. He was given his usual diet containing C. 130 g., P. 70 g., and F. 100 g.; the blood-sugar was normal but a little sugar was excreted in the urine at times suggesting that the threshold of the kidney was slightly lowered. The insulin was reduced by 8 units a day and on the sixth day insulin was not given. The blood-sugar was definitely too high six hours after breakfast at 188 mg. per 100 c.cm., and at 200 mg. and 187 mg. one hour and two hours after the midday meal of 35 g. of carbohydrate. Insulin was given on the sixteenth day but it was not until 30+30 units were given that the blood and urine tests were satisfactory after the midday meal. The condition is now controlled with 30 units of insulin and 20 units of protamine zinc insulin given in one dose. These observations show that he still has diabetes but that it is very mild indeed and I expect it would take some little while before he had any symptoms if he abandoned insulin. He requires 50 units of mixed insulins to control the condition instead of 92 which he needed at one time and has perhaps improved to the extent of 42 units.

Since thinking about this problem, I have remembered another case which puzzled me.

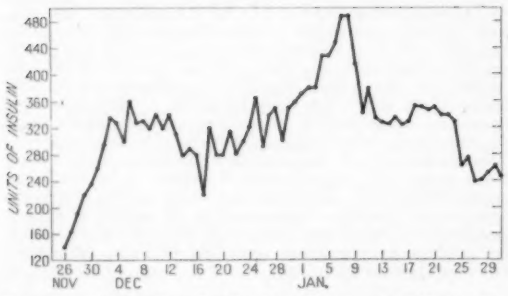
A young man aged 25 developed an acute diabetes. This did not seem severe as he only passed a small amount of sugar on a diet containing 80 g. of carbohydrate. This amount of food was deemed too small and was increased to C. 160 g., P. 70 g., and F. 100 g. He needed 30+30 units before the blood-sugar was controlled. Three months later he only needed 22+20 units for the same food; his general health was much better, but he was bitterly disappointed at failing to obtain a good post to which pension rights were attached. He then attended a foreign clinic and was advised to stop all insulin, the carbohydrate being raised to 200 g. He returned to London and asked me to give him a certificate saying that his diabetes was cured. His blood-sugar was 75 mg. per 100 c.cm. one hour after breakfast, but a sugar-tolerance curve showed conclusively that he still had a low sugar tolerance. I advised him not to increase the carbohydrate of the diet but to continue to test the urine passed after the evening meal so that he might recognise the return of the sugar.

I know of one other case where the reduction of the insulin was made from 36 units to nothing with no ill effects. These observations suggest that when a healthy person who can take 25 to 100 units of insulin a day without causing hypoglycæmia develops diabetes he will need large amounts of insulin before the diabetes is controlled, and that the amount of insulin is not a certain guide to the severity of the diabetes. If the patients improve they will not have overdoses but will continue with the large dose of insulin, although it may now be unnecessary. The diagnosis can be made by reducing the insulin by 8 units a day and watching the blood and urine tests. If the patient still needs insulin the blood-sugar one hour after a meal will rise above 180 mg. and glycosuria will occur, and in this case the dose of insulin should be increased at once. If the diabetic condition has recovered the blood-sugar will not rise, glycosuria will not occur, and the patient can safely leave off insulin provided that the urine passed after the evening meal is tested regularly for sugar. I do not suppose that there are many patients who are taking large doses of insulin which they no longer need, but the possibility should be remembered.

Improvements in Diet

Of the changes which have taken place in treatment, the most important from the point of view of the patient's comfort is the great improvement in the diet. The diets before the Allen régime were very unpleasant owing to the necessity of eating a very large amount of meat and fat together with the various diabetic foods. If the latter contained little or no carbohydrate they were very unpleasant and also very unsatisfying. If they were tolerable the amount

FIG. 10



Changes in the number of units of insulin given to Patient A. B. from Nov. 26th to Jan. 30th.

of carbohydrate was considerable, as 1 oz. of the diabetic food might contain as much as 10 g. of carbohydrate, whereas 1 oz. of ordinary bread contained 14 g. The patient as a rule did not realise he was eating a fair amount of carbohydrate in the form of diabetic foods, and the glycosuria could often be prevented by substituting a diabetic food of very ow carbohydrate content.

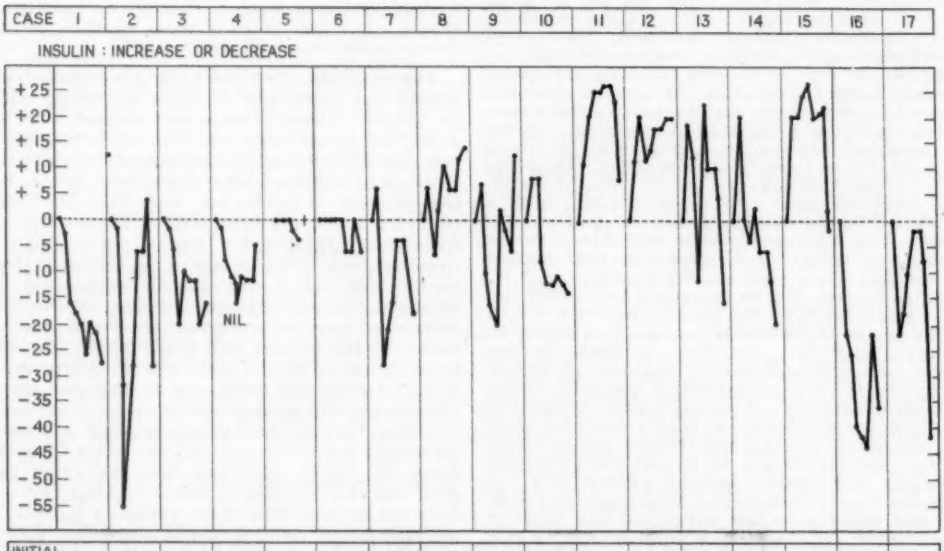
The change from these high protein and fat foods to the low protein and low fat diets was, I think, a great relief to the patient. The "hunger day" was of great value and was easily tolerated by most patients though some found it most irksome. If it was repeated several days in succession or at very frequent intervals in an attempt to keep the blood-sugar normal, the patients usually (but not always) found it almost intolerable, and I suspect stole food on those days. Insulin made it unnecessary to give any more hunger days, but the improvement in the health of the patient, who had been kept alive with severe dieting, was so great that the diet was at first little altered. It was not until four years after the introduction of insulin that Sansum, Blatherwick, and Bowden (1926) published a paper showing that patients were better with more carbohydrate. They had been driven to make experiments by one of their patients who rebelled against the small amount of food he was given. Rather slowly others started increasing the carbohydrate and Geyelin and Mackie (1929) and Rabinowitch (1930) made striking innovations.

A HIGHER CARBOHYDRATE RATION

In this country there was a meeting of the therapeutic section of the Royal Society of Medicine in 1931 at which E. P. Poulton, T. C. Hunt, R. D. Lawrence, J. A. Nixon, A. P. Thomson, and myself all agreed that patients did better when the

INCREASE OR DECREASE IN THE INSULIN REQUIREMENTS OF A SERIES OF 53 PATIENTS DURING THE SEVEN YEARS SINCE THE INCREASE OF THE AMOUNT OF CARBOHYDRATE IN THE DIET IN 1931 (FIGS. 11, 12, 13)

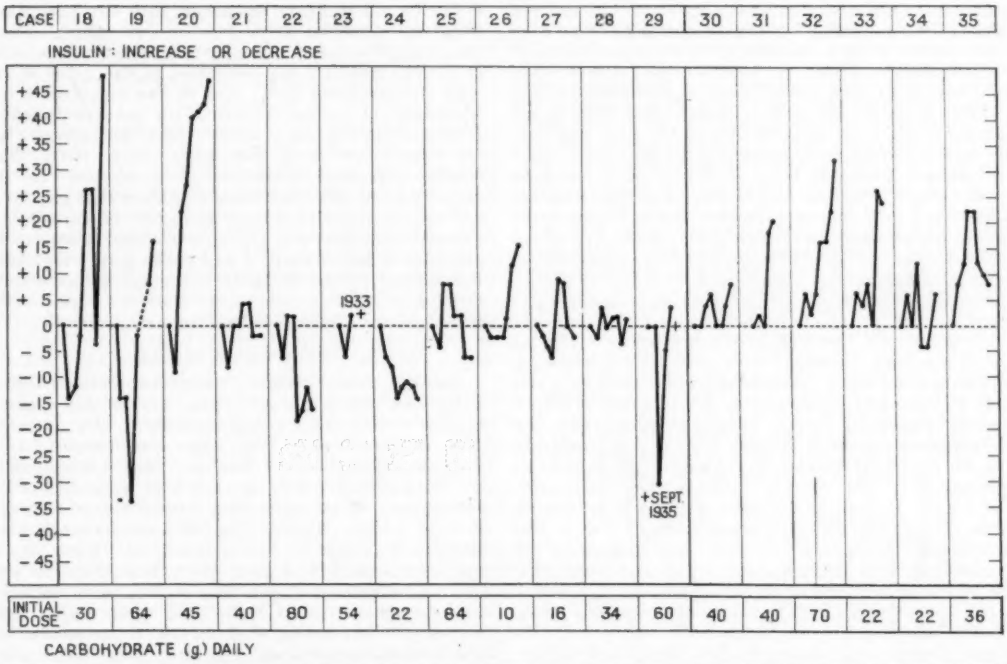
FIG. 11



INITIAL DOSE	38	82	40	16	42	30	76	14	40	22	32	12	60	60	44	70	74
CARBOHYDRATE (g.) DAILY																	
1929	43	43	50	50	41	36	40	36	45	40	45	50	36	46	40	40	40
1930	100	100	80	93	100	78	100	70	100	75	100	80	100	100	80	130	125
1931	113	100	100	108	110	93	125	100	120	100	100	130	100	130	120	130	140
1932	145	100	130	125	140	100	140	120	120	100	130	130	130	130	150	130	140
1933	148	100	130	125	140	100	140	120	120	120	130	130	210	160	150	130	140
1934	145	100	130	125	+	100	140	120	150	120	150	130	210	160	150	130	140
1935	145	100	130	125		100	140	120	150	120	150	130	210	160	150	130	140
1936	145	100	180	125		100	140	120	150	120	150	160	210	160	150	130	140
1937	145	100	180	125		160	209	120	150	120	200	160	210	190	150	130	130

Case 23 died in 1933, Case 29 in 1935, and Case 51 in 1936.

FIG. 12

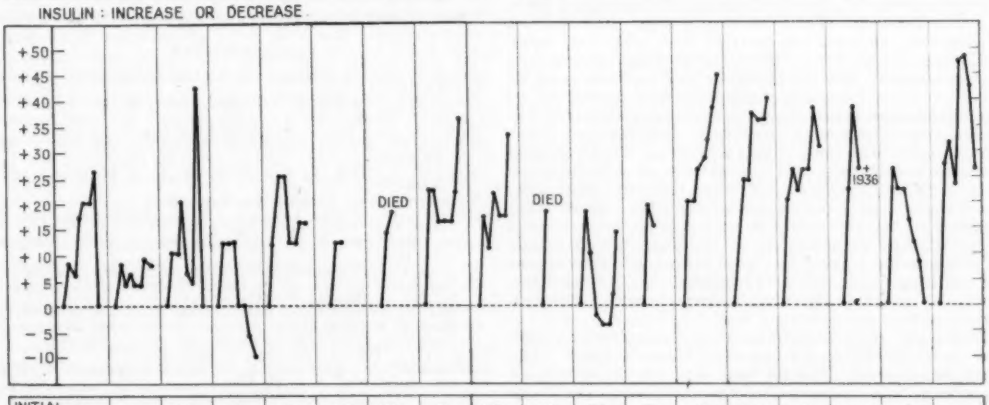


CASE	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
INITIAL DOSE	30	64	45	40	80	54	22	84	10	16	34	60	40	40	70	22	22	36

CARBOHYDRATE (g.) DAILY

1930	40	40	67	47	45	40	40	35	45	45	44	45	45	45	40	40	45	47
1931	135	100	120	120	135	112	100	100	120	100	100	100	100	100	120	100	100	100
1932	135	100	150	150	180	+	100	130	120	100	100	70	130	100	150	100	120	100
1933	180	100	150	150	180		120	130	120	100	145	100	130	100	150	130	120	100
1934	210	100	158	150	180		120	130	115	100	155	100	130	100	150	150	120	130
1935	210	100	158	150	180		120	130	115	100	155	+	130		150		120	130
1936	210	100	158	150	180		120	175	115	130	155		130		150		120	140
1937	210	115	158	150	180		120	175	145	130	155		130		150		150	

FIG. 13



CASE	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
INITIAL DOSE	70	14	30	32	16	40	26	8	75	44	28	13	18	24	10	20	40	18

CARBOHYDRATE (g.) DAILY

1930	46	45	48	67	45	54	44	40	45	40	40	50	53	55	45	53	50	41
1931	145	95	125	110	100	100	120	100	100	120	120	120	130	110	100	130	130	100
1932	145	110	150	110	130	100	120	100	150	+	120	120	130	125	112	130	150	115
1933	145	110	150	195	130	+	+	100	150		120	+	150	125	112	130	150	115
1934	145	110	150	195	130			100	150		120		180	125	112	+	150	115
1935	145	110	230	195	130			100	150		120		210	125	112		150	115
1936	145	110	230	195	130			100	150		120		215	155	127		150	115
1937	145	110	230	195	130			115			120		215	155	127		150	115

carbohydrate was increased. This belief has since been confirmed and the high carbohydrate diet is now widely used, although I still see patients who have been given a diet containing less than 100 g. of carbohydrate. There is, however, still a good deal of controversy over the amount of carbohydrate and fat which should be given. Geyelin and Mackie and Rabinowitch held that the fat of the diet must be decreased to very small amounts and the change from the original diets of C. 50 g., P. 70 g., and F. 250 g. to C. 250–350 g., P. 70 g., and F. 50 g. was very striking. I have not used this very low fat diet as I consider it almost as ill balanced as the old diets; patients find the restriction in the fat of the diet irksome and sooner or later rebel against it. Nor have I used the very high carbohydrate of 250 to 350 g., as most patients do not want to eat so much carbohydrate. The average carbohydrate of the diet in my 100 cases is 150 g., but it has been increased each year. My impression is that at least 100 g. of carbohydrate should be given and if a patient cannot take this amount without causing glycosuria insulin should be given, and the carbohydrate raised to at least 130 g. Many patients over 60, especially women, do not wish to eat more than this amount. The younger patients need much more and I give at least 150 g. and increase it to 200 or 230 g. for young and growing children. One of the complaints of diabetic patients and especially of women has been the poorness of the tea meal, and one of the advantages of the new slow-acting insulins is the improvement which can be made in this meal. At the meeting of the therapeutic section of the Royal Society of Medicine in 1931 mentioned above, I showed the effects of increasing the carbohydrate on the dose of insulin, and I have followed these patients ever since then (Graham, Clark, and Roberton 1932).

No. 1 was the first to whom I gave insulin which I had made myself in 1923 (Figs. 11, 12, and 13). He has made an almost continuous improvement, except for one relapse, and now only takes 10 units a day. No. 2 has shown violent fluctuations due to illness as she has been in coma twice. No. 3 is interesting as her disease started 27 years ago, and after a big initial drop her insulin requirements have fluctuated a little in the last four years. Nos. 7 to 12 all showed an increase in the first year for some unknown reason, but with one exception have shown improvement. The fluctuations in No. 13 are due to tuberculosis of the lungs, which started in 1933. An artificial pneumothorax was performed and the carbohydrate was increased to 210 g. and the insulin is now 16 units less than it was in 1929. No. 14 started diabetes at the age of 12, and is now a well-grown man of 28 and needs 20 units less than in 1929. The results are not always so good. No. 18 started diabetes at 1¼ years and is now 14 years old. He is well but has grown very little indeed and needs 48 more units. No. 20 is a girl, now 20, who shows the striking increase of 47 units. All the others, however, have fairly satisfactory results although the decreases are not very big.

In Fig. 13 the results are not quite so good, as only two patients take less insulin than before. The great increase in No. 38 was due to an attack of jaundice; the increase in the carbohydrate from 150 to 230 g. has been well tolerated and the insulin is still decreasing. Ten patients responded to the increase of carbohydrate by a rise in insulin; in only two has the dose been reduced to the original level. No. 53 is especially noticeable. For some unexplained reason the insulin increased from 40 to 146 units with the increase of carbohydrate from 53 to 130 g. It was reduced to only 66 units on discharge and is now only 40 units. He is an active young golf professional and as he is rather too fat I have not increased the carbohydrate above 150 g.

During the eight years 1931–38 there have been 8 deaths out of 53 patients, and with two exceptions these all occurred after one or two years. From watching these and many other patients improving in general health I am convinced of the value of the high carbohydrate diet. But it was not until I was analysing the mortality-rates of my patients to which I referred in my last lecture that I realised that the death-rate had decreased after 1932. This change coincided with the great increase in the carbohydrate of the diet and I believe that the extra carbohydrate has improved the health of the patients so much that they are able to withstand illnesses like pneumonia and influenza, and make good recoveries. The figures in the Registrar-General's tables should show a marked improvement when the rise in the carbohydrate of the diet has become universal.

FOOD VALUE TABLES

Another great advance which has been made is in the food value tables. Those used in this country are far better than those elsewhere. We owe the form of the tables to Otto Leyton, who realised that English patients could not use food tables easily in which the amount of food was expressed as a percentage. He thought that if the different amounts of food which contain 5 g. of carbohydrate were calculated, patients would exchange their foods much more easily and accurately. G. A. Harrison and R. D. Lawrence extended this system, and McCance and Lawrence (1929) reanalysed many foods and formed the impression that certain fruits contained less carbohydrate than was supposed. McCance, Widdowson, and Shackleton (1936) in repeating this work, however, found that the carbohydrate was less than McCance and Lawrence estimated. The changes which have been made are relatively slight, but I hope they have now reached a stable figure. A large number of foods have been analysed and patients who can afford it have a large choice of fruits, and have no reason to complain of any restriction.

In conclusion I would say that after the discovery of insulin the change in the diet has been a great cause of improvement in general health of the patient.

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PROGRESS IN KENYA.—The Duchess of Gloucester opened an exhibition at the Imperial Institute a short time ago of more than 200 photographs illustrating progress and activity in Kenya. A supplementary series of photographs deals with some aspects of the work of the medical department in Kenya, with special reference to the part played by Africans. These photographs will be exhibited at the health exhibition of the Royal Sanitary Institute in the Connaught Drill Hall, Portsmouth, next week.

MODERN CLASSIFIED TREATMENT OF VARICOSE VEINS

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The treatment of varicose veins is as old as medicine itself, and throughout its story ligature and local destruction of the varices have alternated in favour, each depending for its introduction and popularity on the failures and dangers of the other. The first recorded advocacy of local treatment is that of Hippocrates. In 100 B.C. Celsus suggested ligation. Nineteen hundred years later several toxic and somewhat dangerous solutions were enjoying a transient vogue in Europe, when Trendelenburg reintroduced ligation in the operation that bears his name. The 'twenties of this century saw the eclipse of his operation, the early 'thirties its revival.

The pioneers of injection therapy wrote largely of the different sclerosing fluids which were then under consideration and were more concerned with their immediate efficacy and lack of toxicity, and with refuting the alleged dangers of pulmonary embolism, than with assessing the completeness and permanence of the cure they produced.

As the safety and simplicity of the method became recognised, these cases were quickly relegated from the wards to the out-patient department, where they soon came under the care of house officers, who from the nature of their appointment were seldom afforded the opportunity of observing any but the immediate results of injection. Thus, while disappointment has been growing (but unexpressed) in many quarters, injection has remained an accepted and widely practised method for lack of anyone to cast the first stone. Meanwhile statistics that have been accumulating, largely in America, during the last seven or eight years, have served to support and give expression to these doubts. It has been shown that the remote results of injection therapy alone are far from satisfactory; that a successful course of injections takes, on an average, six to twelve weeks; that even in the most competent hands there remains a proportion of cases which may never show adequate sclerosis after injection; and that, no matter what agent has been used, a recurrence may be expected in two years in from 60 to 80 per cent. (Johnston 1937, Faxon 1933). Suggestions for the remedy of this state of affairs have been frequent over the same period, and, following the tradition of alternation, that most commonly made has been some type of saphenous ligation. Lately, Faxon, Ochsner, and others have adopted a combination of the two methods, uniting the Hippocratic and Celsian practices in the procedure of saphenous ligation and retrograde injection.

It is the object of this article to discuss the anatomy of varicosities of the lower limb, to grade them according to their anatomical degree of severity, to suggest that treatment be determined according to degree, and to describe those methods of treatment which may be simply and safely performed on out-patients.

ANATOMY

For the proper treatment of these conditions it is essential to remember the venous communications of the lower limb.

Long saphenous vein.—Fig. 1 shows only the superficial communications of this vein. The communications to the deep veins are shown diagrammatically in Figs. 3 to 5. Of particular importance are the upper named branches of the long saphenous, the superficial circumflex iliac, the superficial external pudendal, and the superficial inferior epigastric, which join the main trunk at the fossa ovalis 3 to 5 cm. above the point of junction of the medial and lateral femoral cutaneous branches. These last two veins, particularly the medial, make frequent communications with the more distal branches of the long saphenous. Further important communications of the medial vein are with superficial external pudendal and more posteriorly the inferior sciatic veins. It is through these connexions that after simple ligature pressure may continue to be exerted on the veins of the calf.

The average length in the adult of this valved saphenous vein is 80 cm. Its point of termination in the femoral has been plotted by Edwards (1934), with greater mensural exactitude than superficial veins allow, as 3·9 cm. lateral and 1·7 cm.

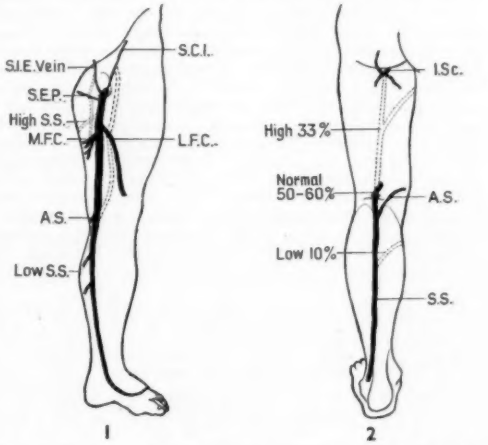

FIG. 1.—The dotted lines show the connexions on the medial side of the thigh between superficial inferior epigastric, external pudendal, and medial femoral cutaneous veins; on the lateral side the connexions between superficial circumflex iliac and lateral femoral cutaneous veins and a reduplicated main trunk are similarly shown.

FIG. 2.—The possible terminations of the short saphenous (Kosinski 1926). S.S. = short saphenous.

below the pubic spine. The figures 4 cm. and 2 cm. are, however, useful in fixing the midpoint of a transverse incision for high ligation.

The communications of the long saphenous with the deep veins are, like its superficial branches, most numerous in the calf. Here they are found in three vertical chains to the posterior tibial, the peroneal, and the anterior tibial venæ comitantes. In the thigh, communications with the femoral vein occur most frequently at the midpoint and at the junction of the lower with the middle third of the thigh. These communications are valved and of small calibre; the valves are directed to permit the flow of blood from superficial to deep systems.

The direction of flow in the long saphenous, set up by muscular movements and by contractility of the vein wall, is determined by the valves which maintain a current from below up, and through the deep communications from superficial to deep systems. The hydrostatic pressure at any point in the veins is dependent both on the distance from that point to the sapheno-femoral junction and on the number of valves between that point and the junction. The valves limit and reduce the pressure. When the amount of dilatation occurs which results in valvular incompetence there is present that retrograde flow which characterises the varicose state, and which further increases the pressure within the vein. The varicose state is a progressive one. The vicious circle

of dilatation and incompetence, leading to increased pressure and further dilatation, proceeds upwards, from points of maximum dependency to the sapheno-femoral junction. When the valves here are affected the hydrostatic pressure in the vein, at the ankle, is more than 100 cm. of water (De Takats et al. 1929). The small calibre of the deep communications and the support which they obtain in their course through deep fascia and muscles makes them the last to be affected. When dilatation and valvular incompetence of these deep communicating veins are present, the pressure in them rises to that of the varicose saphenous system, and the "milking" action by which they relieve stagnation in the superficial system is lost.

Short saphenous and inferior sciatic veins.—In Fig. 2 common variations in course and termination of the short saphenous are shown (Kosinski 1926). The occurrence in this vessel of the varicose state secondary to varicosities of the long vessel is explained by the communications between the two, and the possible terminations, high or low, which the short may have in the long. Its short "normal" course before joining the popliteal, and consequent limited pressure in its distal branches, account for the comparative rarity with which it is primarily affected. When a high termination is present (a persistence of the fœtal condition) it presents an identical problem to that in the long saphenous. Treatment of varicosities of this vein is therefore determined by its anatomical state in the particular case. The short, like the long, saphenous has communications with the deep system. Should either set of deep communications permit reflux, the free superficial anastomosis between the short and long veins causes this reflux to affect both systems.

The inferior sciatic veins, whose distribution corresponds to the posterior sciatic nerve, derive their clinical importance from the communications they effect on the medial side of the thigh. If, when varicose, these collateral channels are left untreated, pressure may continue on the distal veins and result in recurrence.

EXAMINATION OF THE PATIENT

A varicose vein clinic is a port of call to many in whom a graver primary condition exists and demands prior treatment. A gravid uterus and less commonly such pathological conditions as ovarian tumour or fibroids may cause the distal rise in intravenous pressure which initiates the varicose state. Such pathological possibilities can be overlooked unless care is taken to exclude them.

A history of "white leg" is important, not because it constitutes for ever a contra-indication to treatment of such superficial varicosities as are present, but because there is particular necessity in these patients, once the flow in the veins is shown to be retrograde, of treatment along ordinary lines.

Thrombo-phlebitis in varicose veins is seldom infective (Edwards 1938); a history of thrombo-phlebitis, however recent, is therefore no contra-indication for the treatment of any varicosities present. A thrombo-phlebitis in a normal superficial vein is a different problem. It is often infective and may be the herald of a more general disease. These patients may complain of varicosities. The sequence of events is first a thrombo-phlebitis, then the vein is recanalised and, its valves destroyed, undergoes dilatation.

GRADING OF VARICOSITIES

When it has been determined that the case is one of uncomplicated varicose veins, the condition of the valves may be demonstrated by certain well-recognised clinical tests. On the results of these tests varicosities of the long saphenous chain may be arbitrarily graded as I, II, or III.

The use of such a rigid classification has much to commend it. It is based on the lesion whose extent determines both the degree of varicosity and the response to therapeutic measures. Its adoption would make more easy the assessment of published results than the adjectives "mild," "bad," or "extreme," which at present serve to classify varicosities.

Grade I includes the cases in whom Trendelenburg's first test is negative (see Fig. 3). In these there is a competent valve at the sapheno-femoral opening. The vein consequently does not fill from above after it has been emptied of blood. This grade includes cases of superficial "spiderweb" varicosities, local varicosities of the distal branches and of the main chain below its upper end, including those in which a localised valvular defect may be demonstrated below the sapheno-femoral point. They

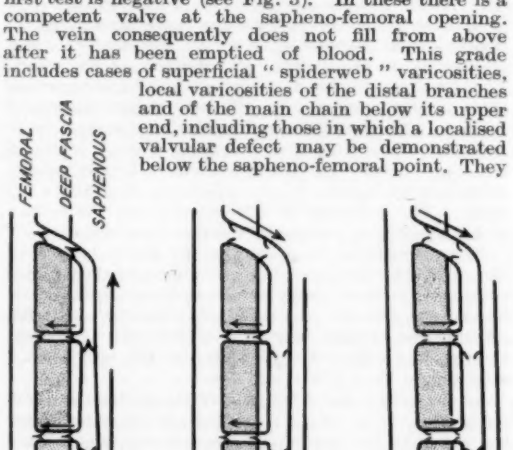

FIG. 3.—Grade I veins in which the valvular deficiency does not extend to the valve at the sapheno-femoral junction.

FIG. 4.—Grade II veins. Here complete incompetence of the saphenous valves is shown. Trendelenburg's test is positive. The vein therefore fills from above.

FIG. 5.—Grade III veins. As well as the saphenous trunk the deep communications are shown to be dilated and possessed of incompetent valves. Trendelenburg's and the tourniquet tests are positive.

share a common property in possession of at least the upper valve, which limits the amount of hydrostatic pressure which can be present within the vein.

Grade II veins (Fig. 4) are those in which there is complete valvular incompetence of the saphenous chain. In them Trendelenburg's test is positive and the hydrostatic pressure in the saphenous system may, at the ankle, be as high as 200 cm. of water. The majority of hospital patients spontaneously complaining of varicose veins belong to this grade.

To *Grade III* (Fig. 5) belong those patients in whom there is valvular incompetence not only of the whole saphenous trunk but also of its deep communications. There is frequently a history of an old deep thrombosis. An overflow exists from deep to superficial systems. In these cases the stagnation in the superficial veins and the hydrostatic pressure in the deep communications are greatest. Trendelenburg's test is doubly positive; that is, while the finger still compresses the upper end of the empty saphenous, the overflow through the deep communications fills the varicosities from below up in less than 30 seconds.

This second test of Trendelenburg is not easy to interpret and gives inconclusive results. The refill from below may be from a varicose short saphenous and not through the deep communications. In a hot or recently active limb the vein fills sufficiently quickly to cause confusion.

A better method of demonstrating valvular deficiency in the deep communications is provided by the tourniquet test. In this test the leg is elevated

and the superficial veins drained of their blood. A tourniquet is then applied at the level of the tibial tubercle to obstruct the superficial veins below the upper end of the short saphenous vein. The leg is then sharply lowered. When the valves of the deep communications are incompetent the superficial veins immediately refill and the result is positive. A negative result shows a gradual refilling as the blood enters the veins from capillaries; it is easily distinguished from the quick refill seen when there is a direct spill from deep to superficial venous systems.

To Grade III belong the most resistant of all cases to injection therapy. As soon as one local sclerosis is obtained the pressure from the deep veins recanalises it or dilates a collateral. Ligation alone can produce only temporary and local improvement.

INJECTION

There have, since 1920, been on the market a number of sclerosing agents known to be effective and of low toxicity. Morrhuate, quinine, and salicylates are all of proved value. The disadvantages of injection therapy, which include a high recurrence rate and a prolonged course of treatment, arise from its use in unsuitable cases.

The majority of out-patient varicose veins are Grade II. In these and in Grade III veins the hydrostatic pressure is such that even maximum dosage may fail to produce thrombosis. The high percentage of injections which do not take is common experience. Further, should immediate thrombosis be produced, the clot in these veins is liable to early disintegration and distal dispersion. The limited amount of sclerosis, often obtained with difficulty in such veins, contrasts strongly with the ease in which long stretches of Grade I veins may be thrombosed by a single injection.

Injection alone should be reserved for Grade I veins in which it is quickly effective and enduring. The sclerosing fluid should be injected in the varicosity, when and where the hydrostatic pressure is lowest. It should be made not only at the highest point of visible varicosity but also with the leg

FIG. 6.—(*a*) Shows a vein before injection; (*b*) the effects of a localised sclerosis which has not affected a collateral channel; in (*c*) the method of recurrence through the dilatation of this collateral is shown; (*d*) shows a "full vein clot" affecting a maximum length of the vein; in this case recurrence through continued pressure dilating a collateral cannot take place, and after organisation of this solid clot recanalisation is unlikely.

horizontal, a position in which the venous pressure is considerably lower than in the vertical (De Takats et al. 1929). For the clot to offer the best resistance to immediate dispersion it should occupy the full vein and be accompanied by considerable intimal damage to cause adherence between it and the vein wall. The solid fibrosis which follows organisation of such a "full vein" clot is, too, less liable to recanalisation than the condition of wall to wall adherence effected by the "empty vein" method of injection (Fig. 6).

The best results of any sclerosing agent only follow maximum dosage, and such dosage is only advisable under certain conditions. The first is absence of sensitivity in the patient to the agent used; the second, constant experience in the use of maximum dosage by the phlebotomist. The initial dose should always be low.

Sodium morrhuate must owe its very wide popularity to the frequency with which 0·5 c.cm. may be spilled in perivenous tissues without subsequent trouble. It is by far the least locally harmful of the three agents mentioned, and indeed the experimental work of Ochsner (Ochsner and Mahorner 1934) would suggest that it is the most efficient of intravenous sclerosing agents. Its chief disadvantage, whose frequency seems often under-estimated, is the occurrence in certain patients of morrhuate sensitivity. This is quite distinct from the mal-effects of faulty technique. There may be immediate and profound collapse; more often this sensitivity is shown by a diffuse eczematoid skin reaction which itches intensely and lasts 2 or 4 weeks. The incidence of morrhuate sensitivity has been found in one series to be 7 in 179 cases (Probstein 1936, Praver and Becker 1935). I have found it present in about 5 per cent. of cases.

LIGATION

Trendelenburg's operation, or ligature of the long saphenous vein, has been performed at varying levels in the thigh. Edwards (1934) has produced an instructive chart showing succeeding surgeons, from Trendelenberg in 1891, placing it higher and higher. Homans in 1916 was the first to advocate ligation of the saphenous at the femoral junction with complete dissection of its upper branches. His views are now widely accepted.

The effect of a ligature on the saphenous trunk is first a fall in the pressure within the distal superficial system, and secondly a variable, but generally minimum, thrombosis within the distal vein. Over a period of a month or more some of the distal varicosities appear to undergo a quiet sclerosis which must depend largely on intimal adherence. The process is often painless and free from inconvenience. If the main trunk alone is interrupted, the distal vein is readily recanalised if subject, as it is in the varicose state, to continued pressure.

Reference to Fig. 1 will show how communicating channels, particularly on the medial side of the limb between the medial femoral, the external superficial pudendal, and in some cases the short saphenous, will continue to provide a means for the continuance of such pressure. The higher the ligation and the more complete the dissection of the branches, the less collateral paths remain to dilate the lower vein.

It will be seen that high ligation does nothing to the deep communicating veins if they are incompetent. In Grade III veins a temporary amelioration may follow ligation alone, but the overflow from deep to superficial veins will soon recanalise and dilate the superficial system. Those veins round the ankle where the pressure is highest and the intimal adherence least, will be the first to recur. High ligation should therefore be reserved for Grade II veins. In such cases, however, it does not always produce either an immediate or a permanent cure. Distal varicosities may remain unobliterated and require subsequent injection, and unligated collaterals may cause early recanalisation.

These disadvantages may be largely overcome by combining high ligation with retrograde injection.

LIGATION AND RETROGRADE INJECTION

Any treatment to replace or supplement injection therapy must be capable of easy and safe performance on out-patients, and while reducing the recurrences, it should shorten the period of attendance.

A ligation flush with the sapheno-femoral junction can involve difficulties which make it unsuitable for performance on out-patients. The incision is close to the groin (2 cm. below the pubic spine), and difficult therefore, on out-patients, to keep clean; in the presence of enlarged inguinal glands the dissection may be accompanied by considerable oozing. Pulmonary embolus is a slight but definite risk (Faxon and Barrow 1938).

A study of the anatomy of this region shows that the advantages of the highest ligation over one 3 cm. lower are not great. It is of prime importance that the ligature be placed above the medial and lateral femoral cutaneous veins which join 4 to 6 cm. below the top of the saphenous vein. Through an incision 5 cm. below the pubic spine the main vessel may be ligated above these. The connexions between medial femoral cutaneous and superficial external pudendal veins, and a "high" short saphenous be interrupted by carrying the incision medially. On the grounds of expediency therefore the incision is lowered 3 cm. when the patient is adipose and has enlarged glands. Such a ligation 3 cm. lower than the top of the saphenous will over a three-year period show a higher recurrence rate than one flush with the sapheno-femoral junction (Faxon and Barrow 1938). The highest possible ligation is preferable when ambulatory treatment is not obligatory.

The optimum time for clot formation in the saphenous trunk is immediately after a ligature has been applied to it, and a full vein thrombosis of the whole trunk is the best guarantee against recurrence. The retrograde injection which follows the application of the ligature completes the treatment at a single sitting.

The best late results for Grade II veins have been obtained by this use of ligation and retrograde injection (Lowenburg 1937, Faxon and Barrow 1938). It is too early yet to speak of my own late results but in all cases (23) during the last six months I have found the immediate results most satisfactory. A solid cast of the old varicose state is obtained within a few minutes of the distal injection of 10 c.cm. of morrhuate into the full vein. The extent of the thrombosis prevents collateral dilatation (Fig. 6) and the solidity is a guard against recanalisation.

When varicosities of the *short saphenous* trunk are associated with those of the long vein, treatment is determined by their anatomical state. If the short saphenous ends in the popliteal vein (50–60 per cent.) a separate ligation where it pierces the popliteal fascia must be performed at the same time as the high ligation and retrograde injection of the long vein. Unless this is done the vein permits an overflow from deep to superficial systems and the retrograde injection of the long vein may fail to take or be quickly recanalised. A "high" short saphenous (33 per cent.) requires separate ligation and retrograde injection at the gluteal fold or fossa ovalis, depending on the case. A "low" short saphenous is a tributary of the long vein and needs no separate treatment.

Varicosities which first appear or progress rapidly during *pregnancy* are, up to the seventh month, best treated along the lines described. Considerable improvement of vulvar varicosities can follow a high ligation which includes a dissection and ligation of the superficial external pudenal (Mahorner and Ochsner 1937). Quinine should not be used as a sclerosing agent in these cases on account of the harmful effect it can exert on the fœtus.

MORE RADICAL PROCEDURES

There remain cases which either fail to respond or soon recur after treatment by ligation and retrograde injection. These include Grade III veins in whom all the deep communications are incompetent. If the deep communications in the thigh alone are affected, an uncommon state of affairs, a distal ligature at the knee-joint combined with a high Trendelenburg operation might be expected, and has been claimed to effect a cure (Ochsner and Mahorner 1934).

If, on the other hand, as is more common, the deep communications of the calf are the most affected, then nothing short of a set operation for their interruption is likely to be permanently effective.

The procedure recently described by Linton (1938) rests upon a sound anatomical foundation and would appear to warrant trial. Through three vertical incisions extending fron knee to ankle, the communicating veins are interrupted and ligated. The varicosities thus become Grade II veins and are treated by a high Trendelenburg operation.

SUMMARY

A description has been given of the pathological anatomy of the superficial veins of the lower limb. It has been suggested that varicosities of the lower extremity should be arbitrarily graded according to the extent of incompetency of the valves. Those placed in Grade I are local and branch varicosities in which the valvular deficiency does not extend to the sapheno-femoral opening, and in which the valves of the communicating veins effect the transport of blood from superficial to deep systems.

Grade II veins, distinguished clinically by a positive Trendelenburg's test, have complete valvular incompetency of the saphenous tree, but in them the flow through the deep communications is from superficial to deep.

Grade III veins comprise those cases of complete valvular incompetency not only of the saphenous tree but of the deep communications as well. They are distinguished by positive Trendelenburg and tourniquet tests.

Such a classification, dependent on easily demonstrated objective criteria, would if generally adopted permit a greater degree of correlation between published results than is possible at present.

The high recurrence rate after injection therapy is considered and reasons have been advanced for the suggestion that the injection therapy alone should be reserved for Grade I veins where the intravenous conditions permit both a rapid and permanent sclerosis.

Grade II veins may be treated by a high Trendelenburg operation with careful dissection and ligation of the upper tributaries. This operation not only removes the channels through which recurrence may take place, but by lowering the pressure in the distal vein makes the condition there optimum for the success of the retrograde injection. The procedure of ligation and retrograde injections is one which is readily performed on out-patients and gives the best chance of permanent relief in the Grade II class.

There remain those Grade III veins in which the valvular incompetence has spread to the deep connecting veins. In these high ligations with retrograde

injection may be successful—failing this, some set operative procedure designed to interrupt and ligate the deep communications is indicated.

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THE IRRITABLE BLADDER OF CHRONIC CERVICITIS

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CHRONIC cervicitis, one of the commonest conditions in gynæcological practice, has as its major cause the trauma and infection of childbirth and abortion. Of 349 patients with cervicitis admitted to hospital 304, or 87 per cent., were parous and in 90 per cent. of these the symptoms were found to date from childbed. In previous communications one of us (Young 1930, 1938) has directed attention to the clinical features and treatment of the syndrome. The present paper describes a special study of one of its most frequent and sometimes one of its most distressing manifestations—namely, bladder irritability. Of the last 44 patients with chronic cervicitis in the Hammersmith Hospital 21 complained of diurnal and nocturnal frequency of micturition.

In the communications already mentioned it was shown that treatment of leucorrhœa and pelvo-abdominal pain is often followed by rapid recovery from associated bladder irritability. The essential element in this treatment is the establishment of drainage of the infected tissues by dilatation of the cervix and cauterisation with the electric cautery. In many instances, however, whilst the cervical inflammation and the leucorrhœa clear up, residual inflammatory deposits or scar tissue in the parametrium cause persistence of the iliac-fossa or low-back pain and of the urinary frequency. That this is dependent upon a continuing irritation of the pericervical nerve plexuses is supported by the fact that the symptoms may respond quickly to a procedure aiming at a blockage of these plexuses at the sides of the cervix (Young 1933). This consists of the injection along the two sides of the cervix of 4 to 8 c.cm. of Proctocaine, an alcoholic preparation made by Messrs. Allen and Hanburys Ltd. (For rationale see Young 1938.) Having established by separate studies the value of these two procedures—namely, dilatation-cauterisation and nerve blockage—we now use them in combination so as to give each patient the maximum of relief.

THE PRESENT OBSERVATIONS

In a sense the influence of the above procedures on urinary symptoms was an accidental discovery. The general improvement often found in the bladder function obtruded itself from an early stage and led to a more complete investigation from which two facts of special clinical interest have emerged.

In the first place, the bladder irritability, although in many cases sufficient to cause severe diurnal and nocturnal distress, is seldom associated with any sign of disease in the urinary tract. The urine is usually sterile and free from cellular elements; the bladder capacity is normal; and the bladder, ureters, and kidneys appear healthy on cystoscopy and radiography. In the second place, there is evidence that the irritative impulses responsible on the one hand for pain and on the other hand for bladder dysfunction involve different nerve tracts in the pericervical area. This was first suggested by the discovery that the routine lateral blockage (the needle being inserted for about 1 in. along the side of the cervix from the level of the vaginal reflection, and the fluid placed so as to infiltrate the tissues along the whole length of the cervix) sometimes gave relief from pain whilst leaving the bladder irritability unchanged. Further study has led to a more accurate differentiation of the pain and bladder areas, and has shown that for urinary distress the blockage is more accurate if carried out at a more anterior level than that employed for the pain complex. The anatomical basis of this improved technique will be discussed later. Its adoption has enabled us to treat the bladder dysfunction with a high degree of certainty, as is exemplified in our most recent series of 44 consecutive cases of chronic cervicitis. In 21 (48 per cent.) diurnal and nocturnal frequency of micturition was present. In 16 (or 76 per cent.) this was immediately relieved, whilst in 2 others there was much improvement.

In addition to cases of bladder irritability caused by cervicitis, we have had under our care several intractable cases, with or without dysuria, in which no disease could be found in the pelvis or in the urinary tract. Brief records of 2 such cases may be given:—

CASE 1.—Aged 47; para-1. She complained of diurnal and nocturnal frequency for two years. It had begun within a few days of the insertion of radium into the uterus to establish a premature menopause because of menorrhagia. The desire to micturate was urgent, and if not satisfied resulted in pain in the lower abdomen. Urine was voided 20–30 times during the day and 6–10 times during the night. There had been several investigations of the urinary tract in hospital and much varied treatment without benefit. On examination some tenderness was present in the right iliac fossa. The cervix was healthy apart from being slightly fixed, and there was pain in the lower abdomen on moving the cervix with the finger in the vagina. This "excitation pain" was badly localised and was accompanied by a desire to micturate; as is usual in such cases, there was an associated history of dyspareunia, combined with a desire to urinate. The urine was sterile and pus-free, the bladder capacity was normal, and no abnormality was found with the cystoscope or radiogram.

Proctocaine (6 c.cm.) was injected into the left side of the cervix and the same quantity into the right side. No reduction in urinary frequency followed. Five days later 5 c.cm. of proctocaine was injected into each side of the bladder base. This gave immediate and dramatic relief, the urinary frequency changing from about 25–35 times in the twenty-four hours to 5 times.

CASE 2.—Aged 46; para-1, 18 years ago. For more than a year has had diurnal and nocturnal frequency, passing urine two-hourly by day and two or three times at night. There was pain at the end of the act. She was under a urologist for nine months, who carried out local treatment for bullous œdema and cyst formation at the neck of the bladder especially over the trigonal area. This condition cleared up but the frequency persisted. Infiltration of the pericervical (parasympathetic) area on each side with 5 c.cm. proctocaine was followed by immediate relief in the bladder irritability.

DISCUSSION

It is not easy to give an accurate anatomical explanation of the above clinical data. We have already emphasised the fact that bladder irritability is not due to any lesion in the urinary tract, and it must therefore be ascribed to some disturbing influence operating from without and exciting the nerve mechanism in such a way that the desire for micturition is evoked by a very small amount of urine in the bladder. It must be assumed that the chronic inflammation in the cervix is in general the primary factor, for, as we have seen, treatment of this alone is often followed by immediate relief of the bladder symptoms, as of the pain. It is possible in individual cases to recognise other and accessory factors. Thus exertion typically aggravates and rest typically relieves the intensity of the bladder irritability. Menstruation and the premenstruum usually increase it and sometimes the disturbance is felt only in association with menstruation. In many cases pressure on the cervix with the vaginal fingers provokes the desire and in such one generally can elicit the history that coitus operates in the same way. These factors all point to the importance of local pelvic stress and congestion.

In the communication first describing this phenomenon (Young 1930) it was suggested that "the condition is reflexly induced by sympathetic irritation" and that the exciting impulses arise in the same pericervical site as those responsible for the pelvi-abdominal pain, usually the chief symptom in the cervical syndrome. The above differentiation between the two sites tends rather to direct attention to the possible rôle of the parasympathetic. The fact that the ordinary lateral blockage may fail whilst the blockage directed to the bladder base is so largely successful is in keeping with the view that the parasympathetic fibres to the bladder are more externally placed than those of the sympathetic system and that to secure them we must place our solution where they converge towards the bladder. Against such an explanation it may legitimately be urged that parasympathetic blockage should abolish the detrusor influence and result in persistent urinary retention. To this objection we can merely reply that we have not encountered this complication.

Finally we would point out that, whereas relief obtained after drainage of the cervix is more likely to be permanent, there is a not inconsiderable chance of recurrence of the symptoms within a few months where we are dependent upon nerve blockage, and sometimes the relief is even more short-lived than this. For such cases a repetition of the procedure is necessary.

SUMMARY

1. Bladder irritability is commonly associated with chronic cervicitis.

2. In a high proportion of cases drainage of the cervix relieves this, as it relieves the other symptoms in the syndrome.

3. Nerve blockage is valuable in intractable cases.

We are indebted to Sir Frederick Menzies, medical officer of health, London County Council, for permission to publish the records of the cases.

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THE ANTIBACTERIAL ACTION IN VITRO OF 2-(*p*-AMINOBENZENESULPHONAMIDO) PYRIDINE ON PNEUMOCOCCI AND STREPTOCOCCI

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Dr. Whitby has lately described the remarkable effect of 2-(*p*-aminobenzenesulphonamido) pyridine* on pneumococcal infections in mice, but he gives no record of any experiments which throw light on its mode of action (Whitby 1938). The following experiments were carried out to ascertain whether this chemical has any action on bacteria in vitro and to see whether any reasonable explanation could be given of its curative action.

If a chemotherapeutic agent is to be successful by direct action on infecting bacteria it seems essential that it should show some antibacterial effect in blood in concentrations which can be achieved therapeutically, and that in such concentrations it should not have any deleterious action on the body defences such as leucocytes.

In experiments on chemotherapeutic agents the end-point taken may be of importance. One may take as a criterion of the efficacy of the chemical its power to kill bacteria, or one may take its power to restrain growth (bacteriostatic power). It is well known that the normal man has a fairly good immunity to the ordinary pyogenic cocci, and normal human blood has the power to destroy a considerable number of these; so that if it were possible to restrain the growth of these cocci in the body by means of a chemical there is every reason to believe that the natural defences, and especially the phagocytic cells, could deal with the infection. For this reason I have preferred to take the bacteriostatic power of the drug as my criterion rather than the bactericidal power.

Concentration of the drug which can be obtained in the animal body.—I have made no observations on this point, but Whitby's experiments give some valuable information. The therapeutic dose varied from 0·25 to 2 mg. per gramme. If the whole of the drug were dissolved in the body immediately the concentration would be 1 in 4000 or greater, but doubtless excretion of the drug rapidly follows absorption, so that in all probability such a concentration is never attained. However, it is reasonable to suppose that concentrations of the order of 1 in 30,000 or 1 in 40,000 can be obtained in the blood.

Methods.—I have used the "slide-cell" method in the way I have previously described for the testing of other antiseptics (Fleming 1924–25). Defibrinated blood infected with a known number of bacteria is mixed with various dilutions of the chemical; the mixtures are placed in slide-cells, sealed and incubated, after which at various times the number of colonies

* As the name of the chemical is rather cumbersome it will be referred to throughout by its laboratory number, T693.

developing is estimated. Normal human defibrinated blood has a considerable bactericidal power towards the ordinary pyogenic cocci, so that when such blood is mixed with a chemical any antibacterial power of the mixture is a summation of the antibacterial powers of the blood and of the chemical. It has been shown, however, that when the leucocytes are removed from blood its bactericidal power is lost (Fleming 1926), so that by using deleucocyted blood the effect of the chemical alone can be estimated. Thus, by observing the action of the chemical in deleucocyted blood and in blood containing its full complement of leucocytes one can estimate the antibacterial power of the chemical in a fluid which is chemically and physically almost identical with blood, and also its power when associated with leucocytes, as it is of course in the human body.

EFFECT OF T693 ON LEUCOCYTES

It was necessary first to show that T693 has no deleterious action on leucocytes in concentrations that can be attained therapeutically in the body. The enterococcus was used as a test organism: I have previously shown that this coccus is insensitive to sulphanilamide and it was hoped that it would likewise be insensitive to T693. The enterococcus is killed off in large numbers in normal human blood by the agency of leucocytes; thus several thousands of cocci can be implanted into 50 c.mm. of blood in a slide-cell and at the most only one or two grow out. However, when a chemical is mixed with the blood in a concentration which harms the leucocytes a greatly increased growth occurs.

TABLE I—INFLUENCE OF T693 ON LEUCOCYTES IN BLOOD. COMPARISON WITH CARBOLIC ACID

Concentration of T693.	Colonies of enterococcus.	Concentration of carbolic acid.	Colonies of enterococcus.
0 (Control)	4	0 (Control)	3
1/256,000	5	1/10,000	3
1/128,000	5	1/5,000	1
1/64,000	4	1/2,560	5
1/32,000	5	1/1,280	248
1/16,000	7	1/640	∞
1/8,000	7	1/320	About 400
1/4,000	6	1/160	0

∞ = uncountable.

Blood infected with enterococci was mixed in equal volumes with dilutions of T693 and incubated in slide-cells. After twenty-four hours the colonies were counted and the result is shown in Table I, along with the result which is obtained in a similar experiment when an ordinary chemical antiseptic is used. It will be seen that with T693 approximately the same number of colonies appear in the control (without chemical) and in all the concentrations of chemical up to 1 in 8000, which is stronger than is likely to be attained in the body. It may be assumed, therefore, that T693 has in those concentrations no deleterious action on leucocytes; otherwise a result would have been obtained similar to that shown with carbolic acid.

ACTION OF T693 ON PNEUMOCOCCI IN HUMAN BLOOD

Deleucocyted blood.—The use of deleucocyted blood gives the true antibacterial effect of the chemical, for such blood has no bactericidal power towards the pneumococcus. The test organism was a pneumococcus (Type 23) recently isolated. Infected deleucocyted blood was mixed with equal volumes of various dilutions of T693 in normal saline and incubated in slide-cells. The results obtained are shown in Table II.

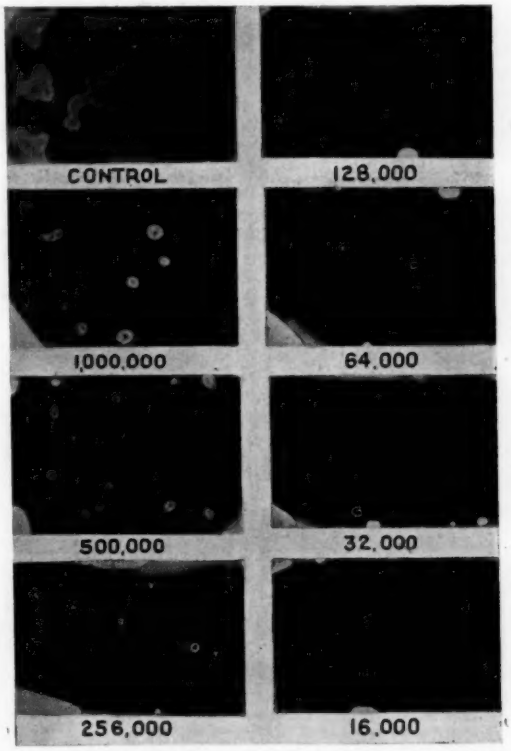

FIG. 1.—Effect of T693 on the growth of hæmolytic streptococci in deleucocyted blood: 24 hours' incubation; implant 20 cocci per cell. Growth is seen in all dilutions but even with only 1 in 1,000,000 the colonies and the areas of hæmolysis are much smaller than in the control.

TABLE II—INFLUENCE OF T693 ON PNEUMOCOCCUS IN DELEUCOCYTED BLOOD

Concentration of T693.	Number of colonies developing from an implant, per cell, of—		
	100	1000	10,000
0 (Control)	106	∞	∞
1/500,000	114	∞	∞
1/256,000	118 small.	∞ smaller.	∞
1/128,000	108 minute.	∞ „	∞
1/64,000	102 „	∞ minute.	∞
1/32,000	90 „	∞ „	∞ small.
1/16,000	107 „	∞ „	∞ „
1/8,000	94 „	∞ „	∞ minute.

It will be seen that with an implant of 100 cocci all the cocci survived and grew out, but there was a very marked inhibition of growth as shown by the size of the colony. In a concentration as low as 1 in 256,000 of T693 the colonies were smaller and in 1 in 128,000 they were in 24 hours only very minute. With a very large implant (10,000 per

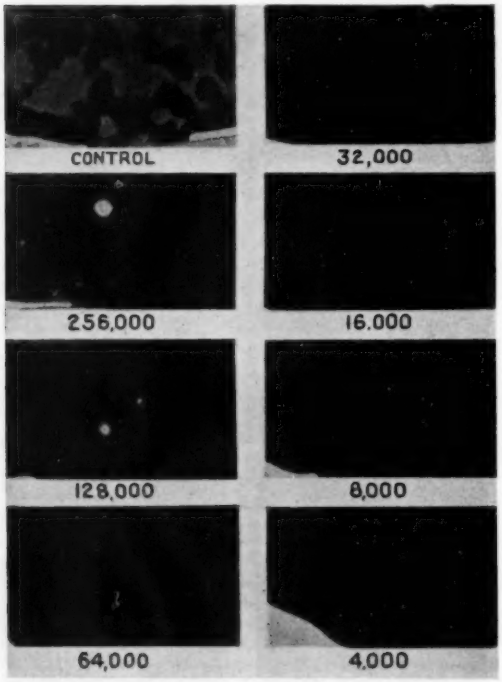

FIG. 2.—Effect of T693 on the growth of hæmolytic streptococci in defibrinated blood containing leucocytes: 24 hours' incubation; implant 29,000 cocci per cell. Note complete absence of visible growth in concentrations of 1 in 64,000 and over.

25 c.mm.) the same inhibitory effect was seen, but it was only noticeable in greater concentrations of T693.

In deleucocyted blood, therefore, T693 has no power of killing pneumococci, but it has a very evident bacteriostatic power even when present only in very small amount.

Defibrinated blood containing its full complement of leucocytes.—This series of experiments was identical with the last, except that blood was used containing its full complement of leucocytes. The results are shown in Table III.

Here it will be seen from the control cells that the blood was capable of preventing the growth of large numbers of pneumococci. With an implant of 100 cocci no growth resulted and only 9 colonies developed out of 1000. The colonies which did develop in the control cells were all large, and it appears that if any pneumococci are able to withstand the natural antibacterial agencies present in blood they grow out freely. When, however, T693 was present in a concentration of 1 in 128,000 only 5 small colonies developed out of an implant of 10,000, and with twice that concentration growth was completely inhibited. Even with an implant of 100,000 per cell (=4,000,000 per c.cm.) no growth took place in a concentration of 1 in 32,000 of T693.

A comparison of Tables II and III brings out some interesting points.

(1) Normal human defibrinated blood can prevent the growth of large numbers of pneumococci.

(2) If the leucocytes are removed from such blood, all the pneumococci implanted grow out freely.

(3) In deleucocyted blood T693 has no bactericidal power, but delays the growth of pneumococci.

(4) In normal human blood T693 completely prevents the growth of pneumococci even when present only in high dilution.

TABLE III—INFLUENCE OF T693 ON DEFIBRINATED BLOOD CONTAINING ITS FULL COMPLEMENT OF LEUCOCYTES

Concentration of T693.	Number of colonies developing from implant per cell of—			
	100	1000	10,000	100,000
0 (Control)	0	9	24	471
1/500,000	0	9	..	..
1/256,000	0	6	23	459
1/128,000	0	8	5 small.	990 small.
1/64,000	0	0	0	? 900 minute.
1/32,000	0	0	0	0
1/16,000	0	0	0	0
1/8,000	0	0	0	0

The simplest explanation is that T693 delays the growth of the cocci and does not inhibit the action of the leucocytes, so that the leucocytes are able to deal with a much larger number of pneumococci than they are normally capable of killing.

ACTION OF T693 ON HÆMOLYTIC STREPTOCOCCI

Experiments exactly similar to those described were made using blood and deleucocyted blood implanted with a Group A hæmolytic streptococcus ("Richards").

Deleucocyted blood.—With such a hæmolytic streptococcus growth in blood is rapid, so that after 24 hours the hæmolytic areas coalesce and as the colonies are diffused it is impossible to give an accurate count of their number. Observations were therefore made at shorter intervals. The results obtained are shown in Table IV.

TABLE IV—INFLUENCE OF T693 ON HÆMOLYTIC STREPTOCOCCUS "RICHARDS"

Concentration of T693.	Number of colonies visible at various intervals. Implant per cell = 20 cocci.			
	5 hrs.	6½ hrs.	24 hrs.	
0 (Control)	8	12	¼ lysis.	
1/1,000,000	0	6 small.	15	Gradually getting smaller.
1/500,000	0	11 „	15	
1/250,000	0	4 minute.	17	
1/128,000	0	1 v. minute.	18	
1/64,000	0	0	14	
1/32,000	0	0	17	
1/16,000	0	0	10	

There was a definite delay in the appearance of hæmolytic areas which indicated the growth of streptococci. After 5 hours there was evident growth and hæmolysis in the control cell, but even in 1 in 1,000,000 dilution of T693 there was no visible growth. After 6½ hours there was no visible growth in the cell containing 1 in 64,000 of T693, but after 24 hours growth had occurred in all the cells, and, except in the last cell containing 1 in 16,000 T693, there was no appreciable diminution in the number of colonies. There was, however, a very striking diminution in the size of the colonies and the areas

TABLE V—COMPARISON OF T693 AND SULPHANILAMIDE ON PNEUMOCOCCUS TYPE 15

Concentration of drug.	Number of colonies developing.			
	T693.	Sulphanilamide.	T693.	Sulphanilamide.
Control (saline).	13	14	196	189
1/500,000	16	20	..	..
1/256,000	6	29	240	..
1/128,000	2	13	36	175
1/64,000	0	4	2	75
1/32,000	0	4	0	46
1/16,000	0 (Implant 750 per cell.)	0	0 (Implant 7500 per cell.)	6 small.

of hæmolysis, as is shown in Fig. 1. Even when only 1 in 1,000,000 T693 was present, the areas of hæmolysis were smaller and were not confluent and the actual colonies were small and compact as compared with those in the control.

It seems, therefore, that with hæmolytic streptococci, as with pneumococci, T693 does not kill the organisms, but it delays their growth and (probably for this reason) inhibits the development of hæmolysin.

In defibrinated blood containing its full complement of leucocytes.—The results obtained are illustrated in Fig. 2. With an implant of 2900 "Richards" streptococci per cell there were in the control cell large confluent areas of hæmolysis, and it was obvious that a considerable number of colonies of streptococci had developed. In the weakest concentration of T693 only 4 small colonies were visible, and in 1 in 64,000 no growth occurred even after the cells had been incubated for several days.

We have then with the hæmolytic streptococcus exactly the same results as with the pneumococcus. There is no bactericidal effect, and growth is merely delayed in the absence of leucocytes; but growth is permanently inhibited when leucocytes are present even when only very weak concentrations of the chemical are introduced.

A COMPARISON WITH SULPHANILAMIDE

Experiments similar to those just described were made using blood infected with pneumococci or streptococci mixed with various dilutions of T693 or sulphanilamide. The results with pneumococcus are shown in Table V, and with streptococcus in Fig. 3. From Table V it will be seen that T693 has a much greater antipneumococcal action than has sulphanilamide. Fig. 3 illustrates the action of these two chemicals on hæmolytic streptococcus "Richards," and it is evident that T693 is also more potent in blood towards this organism.

SIMULTANEOUS USE OF IMMUNE SERUM

It has been shown in the above experiments that T693 has in itself no bactericidal power in blood in concentrations which are likely to be attained in the body therapeutically, but that it has in such concentrations a bacteriostatic action which, in the presence of leucocytes, is sufficient to destroy considerable numbers of pneumococci and streptococci. As the destruction of the cocci was a function of the natural defences of the blood it was argued that the higher the degree of immunity the greater would be the number of cocci which the blood-T693 mixture would be capable of dealing with. An experiment was made in which T693 was tested on pneumococci in blood with and without specific immune serum. Normal human defibrinated blood was infected with pneumococcus Type 1, and 25 c.mm. of this was mixed with 25 c.mm. of dilutions of T693 and 10 c.mm. of immune serum or saline. These mixtures were placed in slide-cells, incubated for 24 hours, and the number of colonies of pneumococcus which developed was counted.

It will be seen from Table VI that in blood alone and in blood containing T693 large numbers of pneumococci grew out. In blood containing immune serum there was a great reduction in the amount of growth, but still over 300 colonies were present. When, however, T693 and immune serum were together in the blood growth was completely restrained. T693 and immune serum themselves were incapable of this inhibitory action, as is shown by the fact that when these were present in deleucocyted blood copious growth resulted. This experiment again shows that the leucocytes are necessary for the destruction of the pneumococci and that they function most satisfactorily in the presence of T693 and the specific immune serum.

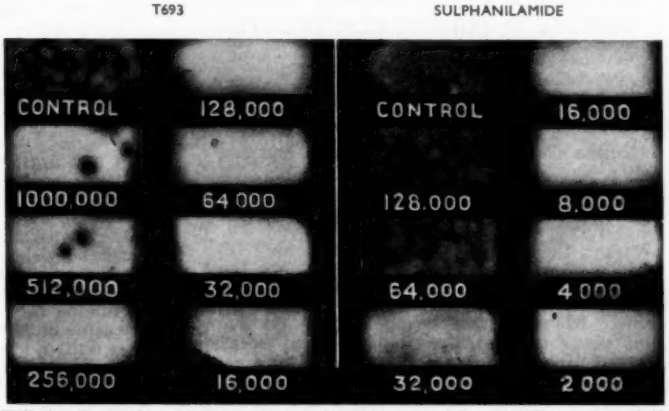

FIG. 3.—Comparison of the potency of T693 and sulphanilamide on hæmolytic streptococci (Richards): 24 hours' incubation; implant 19,300 cocci per cell. T693: much growth and hæmolysis in control; scanty growth in 1 in 1,000,000 and 1 in 500,000; none in 1 in 256,000. Sulphanilamide: much growth and hæmolysis in 1 in 64,000; less copious growth in 1 in 32,000; none in 1 in 16,000.

TABLE VI—INFLUENCE OF T693 ON PNEUMOCOCCI (TYPE 1) IN HUMAN BLOOD WITH AND WITHOUT IMMUNE SERUM

25 c.mm.	+	25 c.mm.	+	10 c.mm.	Colonies.
Blood.		Saline.		Saline.	∞
"		"		Immune serum.	360
"		T693 16,000	+	Saline.	∞
"		T693 32,000	+	Immune serum.	0
Deleucocyted blood.	+	T693 16,000	+	Immune serum.	∞

Implant = 1,800,000 cocci per c.cm.

It seems therefore that when drugs such as T693 are employed the immunological state of the patient has to be taken into consideration. If the infecting organism is very susceptible to the drug it may be possible for the infection to be dealt with even when the patient's immunity is low; if the organism is less susceptible it will require a higher degree of immunity and when the organism is insusceptible then immunity will be the only factor.

It seems essential, therefore, if the best results are to be obtained from the use of such a chemotherapeutic agent, that the patient should be immunised, actively or passively, to the highest degree possible. The sensational results obtained with sulphanilamide, and those which we may expect with T693, tend to make physicians lose sight of the immunological aspect; but it seems clear that this is a most important part of the treatment to round off the good work commenced by the chemical.

SUMMARY

The preparation 2-(*p*-aminobenzenesulphonamido) pyridine, here called T693, retards the growth in human blood of pneumococci and hæmolytic streptococci in concentrations which it is reasonable to suppose can be obtained therapeutically.

It has in such concentrations no bactericidal effect.

Blood containing T693 in such concentrations can destroy considerable numbers of pneumococci and streptococci. Leucocytes are necessary for this destruction.

If blood is rendered "immune" by the addition of some specific immune serum, the apparent effect of the chemical is enhanced.

It is suggested that to obtain the best results with the drug, patients should be immunised actively or passively.

In conclusion I would like to thank Mr. A. J. Ewins, D.Sc., of Messrs. May and Baker, for kindly furnishing me with a supply of the drug.

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CLINICAL AND LABORATORY NOTES

THROMBOSIS OF CENTRAL VEIN OF RETINA SUCCESSFULLY TREATED WITH HEPARIN

A SECOND CASE

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A POST-OFFICE clerk of 59, who worked as a porter at a theatre in the evenings, had been healthy until recently when his legs began to feel heavy, with slight pains in the calves, and he had occasional transient attacks of vertigo accompanied by vertical headaches. He noticed no swelling of his legs or shortness of breath. On Feb. 18th, 1938, he became aware of dark spots in the right half of his field of vision which disappeared after a few days. A week later his sight began to fail. He wore stronger glasses for his work but these did not help him.

On examination (March 11th, 1938) his eyes appeared normal externally and the pupil reactions and tone were normal. Right eye: vision (+2·0, 90°) = 0·10–0·15 (in 1933 vision was 0·9); field of vision normal (confrontation); ophthalmoscopy revealed confluent, widespread hæmorrhages extending far into the periphery; normal retina visible in places; papilla margins obliterated with radiating streaks of blood and haziness in the surrounding retina; veins only visible in short stretches, sinuous and greatly dilated; extremely difficult to see any arteries. Left eye: vision (+ 1·5, 90°) = 1·0 (same as in 1933); field of vision, media, and fundus normal.

On admission to the Maria Hospital on March 15th the patient's face was ashen grey and slightly cyanotic. There was no dyspnœa or œdema. He had a slight vertical headache but no other symptom except impairment of vision. His heart was somewhat enlarged on the left side with a soft systolic vesicular murmur and accentuation of the aortic second sound. Blood pressure 230/110 mm. Urine: Heller, negative; Ehrlich, traces. Sedimentation-rate, 10 mm. in one hour. Hæmoglobin, 101 per cent.; red blood-cells, 5,350,000. Meulengracht, 1:8; Van den Bergh, 1·25/200,000. Electrocardiography on March 16th showed regular rhythm, 68 beats per min.; A–V, 0·14 sec.; relative hypertrophy on the left side. Radiography on March 17th showed only slight enlargement of the aorta and no arterio-sclerosis in the legs.

Treatment.—The patient was kept in bed on a low-salt diet until March 23rd. Heparin* was then given (intravenously in 5 per cent. solution) as follows: March 23rd, 0·15 g.; 24th and 25th, 0·1 g. twice daily; 26th, 0·15 g. three times daily; 27th and 28th, 0·15 g. twice daily. On March 29th the patient stated that the vision of his right eye had improved, and his general condition seemed better. Right eye: vision with glasses 0·4 (Hess); media clear; details of fundus not so hazy in the posterior pole; still the same numerous large hæmorrhages; no degeneration centres; no limitation of field of vision; tone normal (palpation). Left eye: as before.

Subsequent progress.—The patient was discharged from hospital on March 28th and heparin was continued in the out-patients' department, 0·15 g. being given twice daily on March 29th and 30th and daily from March 31st to April 6th, and on April 8th, 10th, and 12th. On April 6th the vision of the right eye had again improved. Right eye: vision with glasses 0·6; fundus and field of vision as before; tone normal (palpation). Left eye: as before.

April 13th: Right eye: vision 0·6; hæmorrhages definitely smaller, especially in the periphery, with pale edges; no white centres around the macula; papilla margins clearer, with several very small, radial hæmorrhages; veins definitely smaller and less twisted.

April 21st: the patient wanted to begin work. He had now no symptoms in the eye. Right eye: vision 0·6; details of fundus considerably clearer; large areas of normal retina now seen between the hæmorrhages; the vessels easier to make out, and the arteries can be followed; numerous diffuse whitish-yellow spots over the larger branches of the veins; papilla margins fairly well visible; fewer hæmorrhages in the papilla.

April 28th: Right eye: vision slightly over 0·6; fundus still clearer, particularly in the periphery.

* The heparin used was manufactured by Vitrum, Stockholm, in collaboration with Dr. Jorpes of the Caroline Institute, Stockholm.

DISCUSSION

The diagnosis in this patient can hardly be questioned and the regression of his retinal changes corresponded with the improvement expected from heparin treatment. In intravascular thrombosis the thrombus acts as a foreign body, producing kinase and a tendency to coagulation in its neighbourhood. Heparin treatment is based on the fact that heparinised blood coagulates less easily (Murray et al. 1937). If the thrombus does not continue to grow, the coagulum first retracts, which may cause a parietal canalisation, and later the thrombus itself is slowly dissolved by the action of proteolytic enzymes. The changes in this case agree very well with such reasoning.

The results of treatment in this patient agree with those recently recorded by Holmin and Ploman (1938) in the same type of case, and support their view as to the desirability of trying heparin in cases of similar nature, and using it as early as possible in the illness.

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SULPHONAMIDES IN MALARIA

By R. Pakenham-Walsh, B.M. Oxon., D.P.M.
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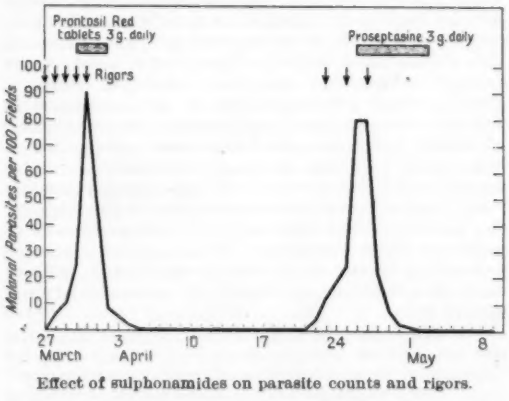
Since the evidence so far published (van der Wielen 1937, de Leon 1937, Hill and Goodwin 1937, Read and Pino 1938) concerning the possible anti-malarial action of sulphonamides is not unanimous, the following case is reported as a contribution towards the solution of this problem.

CASE RECORD

A man of 69 suffering from general paralysis was inoculated with benign tertian malaria on March 16th, 1938, but was subsequently found to have cystitis.



Effect of sulphonamides on parasite counts and rigors.

It was therefore decided to treat the cystitis with sulphonamide preparations, bearing in mind their possible antimalarial action. His first rigor was on March 27th and the accompanying Chart shows the effect of treatment on the parasite counts and rigors. On June 14th the malaria relapsed and quinine was given—i.e., after a quiescent period of nearly 7 weeks since the eighth rigor.

We wish to thank Dr. J. D. Silverston, medical superintendent of the hospital, for permission to publish this case.

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ON THE EFFECT OF TESTOSTERONE PROPIONATE ON BLOOD PRESSURE

By Raymond Greene, M.A., D.M. Oxon.
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(*From the Department of Human Anatomy, University of Oxford*)

In a recent communication,[1] Steinach, Peczenic, and Kun reported an investigation into the effects of various "male" hormones on male patients suffering from hypertension. They observed a significant fall in systolic pressure in 31 out of 49 cases treated with androsterone benzoate and testosterone propionate. The diastolic pressure was less obviously effected.

Case.	Age.	Dosage in mg.			Period of treatment in weeks.	Blood pressure.	
		From.	To.	Total.		Before.	After.
1	72	10	40	430	12	174/110	178/110
2	67	20	40	460	12	154/84	150/82
3	70	20	50	630	14	170/94	174/92
5	70	20	50	370	10	130/78	134/80
6	77	10	50	430	12	172/99	170/88
7	69	20	50	610	12	178/90	192/92
8	60	50	200	1500	12	200/120	194/110
9	58	100	200	1300	9	158/80	156/78
10	71	50	200	1200	12	220/130	210/128
12	66	50	50	750	12	180/80	182/80
14	61	50	50	1550	31	150/90	156/86
16	60	50	50	500	9	170/100	170/100
17	72	50	50	600	13	182/100	180/96
21	71	200	200	2400	12	118/62	120/60

Subjective symptoms of high blood pressure were found to be improved. Those few cases which were refractory to "male" hormone alone were apparently improved when œstradiol benzoate was added, a somewhat surprising observation. The cases treated with testosterone propionate received from 5 to 50 mg. at each injection and a total dosage of from 50 to 500 mg.

During the course of an investigation,[2] not yet completed, into the effects of testosterone propionate on senile enlargement of the prostate gland, I have had under observation 21 patients of ages between

[1] Steinach, E., Peczenic, O., and Kun, H., *Wien. klin. Wschr.* Jan. 28th, 1937, p. 102, and Feb. 4th, p. 134.
[2] Conducted in conjunction with Dr. S. Zuckerman under the ægis of the Therapeutic Trials Committee of the Medical Research Council.

fifty-eight and seventy-seven, some of whom have an abnormally high blood pressure. In 14 of these cases, those who have been receiving treatment at my own hands, the blood pressure has been taken at least twice during the course. Full details of these cases will be given when the investigation is completed. From the accompanying Table it will be seen that, with the dosage used, the blood pressure did not change significantly in any of the patients.

I have to thank Mr. T. F. M. Smart, of Ciba Ltd., for the supply of testosterone propionate used in this investigation.

MEDICAL SOCIETIES

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

THE annual conference of this association was held in London on June 30th, and was opened by Mr. WALTER ELLIOT, Minister of Health, the Marchioness of TITCHFIELD presiding.

Mr. Elliot said that human life—brain and muscle—was the only real capital of a country. The tuberculosis death-rate was now one-fifth of what it was 70 years ago. The tuberculosis dispensary and its expert staff was one of the mainstays of anti-tuberculosis work; the personal touch which it afforded was invaluable, and could never be replaced by purely mechanical organisations. A notable contribution to the campaign was the improved housing in rural areas where it was badly needed, the rural death-rate from tuberculosis in some areas being double that of the country in general.

The discussion on the development and organisation of

Antituberculosis Activities in Rural Areas

was opened by Dr. G. LISSANT COX (Lancashire County Council). Although pulmonary and non-pulmonary tuberculosis, he said, had a lower incidence and mortality in the rural than in the urban areas, measures for prevention and treatment ought to be available for the rural population. There was still considerable overcrowding in rural areas, and often greater difficulty in remedying housing defects than in towns. Small rural counties should combine in joint schemes for the prevention and treatment of all forms of tuberculosis. Some 60 per cent. of adult pulmonary cases died within five years of coming to their notice, which emphasised the importance of preventive measures. The two units of the anti-tuberculosis campaign, the dispensary and the institution, should operate in unison, preferably being staffed by the same team of doctors. Coöperation with general practitioners, the unhampered use of X rays, which were now as essential as the clinical thermometer, and whole-time tuberculosis health visitors were important parts of the work of the dispensary unit. The institution unit required as to pulmonary tuberculosis (adults and children) a basis of 80–90 beds per 100 pulmonary deaths, and for non-pulmonary cases about 150 beds per 100 non-pulmonary deaths. Fundamentally there was no difference between the principles of a tuberculosis scheme in a rural and an urban area.

Dr. A. M. FRASER (Inverness) agreed that the antituberculosis campaign in rural areas must vary only in the methods of application, the principles being the same as underlay tuberculosis work elsewhere. The organisation of proper auxiliary facilities for diagnosis operated by well-qualified personnel was of first importance. Adequate post-graduate training facilities and a full range of laboratory services should be available for all practitioners. The importance of an adequately informed domiciliary nursing service could not be over-estimated. In rural areas dispensaries as such were not feasible; the dispensary must be at the patient's own hearth. To provide effective service, authorities would have to collaborate on a regional basis and pool their resources.

Dr. V. EMRYS JONES (Anglesey and Caernarvonshire) said that the incidence of tuberculosis in North-West Wales was very high indeed, the average annual rate for the last ten years being over 1500 per million, with a correspondingly high death-rate. Approximately 40 per cent. of all new cases of tuberculosis seen each year had advanced disease on initial examination. Many causes had been suggested as contributing to the high incidence-rate: bad housing, occupational factors, poor nutrition, unsatisfactory disinfection, and inadequate after-care schemes. It was sound economics to look upon the patient and family as one unit, both from the point of view of helping to treat the disease and in the prevention of spread to other members of the family.

Dr. E. RIST (Paris) said that one original feature of antituberculosis work in France was the coöperation of the railway systems. The State railway system covered the greater part of western France—mainly rural country, devoted to agriculture. A large railway carriage had been equipped with an excellent X ray apparatus and a consulting-room; and on certain days people on the route were informed that the X ray carriage would be in their neighbourhood. With the coöperation of the visiting nurses this plan had been most successful in reaching large numbers of people who would otherwise have had no chance of medical examination.

Dr. R. A. YOUNG presided over the discussion on the

Family and Tuberculosis

with special reference to the discovery and protection of contacts in a tuberculous household.

Dr. G. T. HEBERT (London) said that when, many years ago, Sir Robert Philip emphasised the importance of contact examination as one of the duties of the tuberculosis officer, it was hoped that by such examination all new cases could be discovered in an early and treatable stage, and that there would in course of time be fewer advanced cases to act as sources of infection both at home and elsewhere, so establishing gradually a control over tuberculosis comparable to that which had been obtained over small-pox. But results had fallen far short of expectations, possibly owing to a failure to realise the inherent difficulties of the problem. The chief object of his paper was to point out these difficulties and to suggest a scheme for making the most of contact examination. Three medical considerations must be remembered and applied:

(1) Many cases of incipient tuberculosis presented few recognisable symptoms and signs, requiring for their discovery a complete and careful examination.

(2) There might be a long latent period, averaging 3½ years, between infection and manifest disease, so that repeated examinations, rather than a single one, would be required.

(3) Tuberculosis occurred particularly during the age-period 15 to 25, so that special attention should be paid to adolescent and young adult contacts.

The perfunctory examination of a contact was of little value and might even do harm by giving a false sense of security. A careful clinical inquiry must be supplemented by X ray examination and routine tuberculin skin tests. Owing to the latency of the development of tuberculosis, a continuous medical supervision would seem to be necessary, particularly during the susceptible age-period. Age was, indeed, of the greatest importance in the medical investigation of a tuberculous household. Apart from adolescents and young adults, the contacts who should receive especially careful attention were those not in normal health, those who had been in close contact with the infection, and the consort of a tuberculous husband or wife. The two main reasons for attempting to control tuberculosis in the home were that (1) infection was a factor in the causation of secondary cases, and (2) control of infection was a preventive measure, whereas the detection of early cases was merely an attempt to remedy damage already done. It was important at the outset to make certain of the real source of infection, and it was essential that massive infection should be controlled.

Dr. G. S. BANKS (Aberdeen) emphasised the importance of the family as a factor in the perpetuation of tuberculosis, which should always be the focus of their antituberculosis activities. The system of deleting cases from a tuberculosis register when they were judged to be arrested and non-infective for a certain period was open to criticism if it meant the discontinuance of contact observation. A more general method of case-finding was needed. All children who had reacted positively during school life should be kept under observation later and periodically radiographed, especially during the dangerous age-periods of adolescence and adult life. The principle of contact examination was sound, but was not by itself sufficient; it had to be followed up by prolonged observation of the family.

The Marquess of DUFFERIN and AVA presided over the discussion on the

Control of Tuberculosis in Tropical and Sub-Tropical Regions

Prof. S. LYLE CUMMINS (Welsh National School of Medicine) gave grounds for believing that the African native was entering upon the path of relative immunity—an immunity against the onset of the disease, not against the spread of the process in the organs when once started, for the African, like the American negro, seemed to get a generalised type of tuberculosis when he developed the disease at all. The road to immunity of a really satisfactory kind seemed to be long and hard; different kinds of ancestry counted for a great deal in the struggle against tuberculosis. Environment doubtless played a large part in this disease. The African native left to himself in his own village under native conditions appeared to get on well when faced with infection brought to him from outside. It was when he was brought into the compounds, near great cities, and exposed to all the harmful influences of native sanitation under semi-civilised conditions that the black man manifested his great liability to the disease. Poor resistance was also shown when he was called upon to endure unaccustomed conditions of mining or of military service. Nevertheless some degree of immunity did appear to be developing in certain places, and the prospects of the native, whether in his own village or called up for mining, seemed to be better than was at first supposed.

Dr. E. COCHRANE (Colonial Medical Service) said that for over thirty years active measures had been taken to prevent the spread of the disease in Trinidad and British Guiana. Port of Spain and Georgetown had dispensaries running before the first one had been started in England. The methods employed closely resembled those in this country although the conditions were dissimilar. British Guiana was a small and a poor country, situated near the Equator and largely peopled by races peculiarly susceptible to tuberculosis, yet they had there to-day a tuberculosis death-rate of only 8 per 10,000.

Dr. N. D. BARDSWELL (Medical Commissioner in Cyprus for N.A.P.T.) said that the scheme of tuberculosis administration in Cyprus was the familiar combination of dispensaries, sanatorium, beds for advanced cases, a tuberculosis officer, and a visiting staff. One-third of the island was now under fairly effective control. The problem of home supervision was still formidable, and for the villages the only solution appeared to be a mobile nurse unit attached to the dispensaries working under the direction of the tuberculosis officer. The difficulty here was the lack of nurses or women trained in social work. A minimum of six home visitors was needed, of whom two were now under training, and at the moment there were no funds to pay for more.

At the last session the subject for discussion was the

Mental Aspects of Tuberculosis

Dr. J. R. REES (medical director, Tavistock Clinic) said that it was only in the past twenty years that the medical profession as a whole had begun to recognise the existence of the psychoneuroses as a clinical reality. He had been asked to speak on how tuberculosis affects the life of the normal person, but it might be better to consider the average person. It was his task to set them speculating as to the interrelation of emotion and tuberculosis. M. J. Breuer in 1935 had reported a definite psychological factor in the ætiology of 34 out of 100 consecutive cases of pulmonary tuberculosis which he examined. Researches, properly controlled, had been made as to the rôle of anxiety in bodily disorders of various types—peptic ulcer, ulcerative colitis, cardiac pain, hay-fever—and had demonstrated the importance of emotion in the causation and perpetuation of these conditions. Little work had so far been done in linking the tuberculous field with that of the psychiatrist. The extraordinary variation in the susceptibility of individuals and even members of the same family could in many cases only be explained in terms of emotional or psychogenic factors. It was certain that severe emotional disturbances lowered resistance to disease, and many records showed how the origin of tuberculosis or a relapse had been determined by such incidents. Just how this emotional disturbance produced this lowering of immunity was uncertain. The fine and sensitive type of man had always been supposed to be specially predisposed to tuberculous infection, but it might well be that those who belonged to what was called the schizoid group, who certainly did not breathe as they should, and therefore had a poor pulmonary ventilation, were specially liable. These schizoids were somewhat withdrawn from life, living inside themselves. W. Freeman had shown that in an American mental hospital tuberculosis had a vastly greater incidence in the schizoid type than in any other group. Those who made a regressive reaction under stress and in face of fear were predisposed to tuberculous infection. Dr. Rees doubted whether there was any set or fixed type of reaction

to tuberculosis, though there was a typical reaction to disease and consequent confinement. Because the sanatorium, however unwanted, was a retreat, it must bring out in many individuals their childish and regressive tendencies. The sheltered workshop for tuberculous patients seemed an effective contribution to the solution of the problem, and so on the psychological side was occupational therapy which should not be limited to handwork but should include ward education and planned study. A psychological outlook on the part of the doctor attending tuberculous patients and a concern on the part of local authorities not only to improve the environment of the dispensaries but to secure the economic status of the sanatorium patient were helpful factors in treatment.

Dr. ANDREW MORLAND (London) pointed out that mental characteristics made some people more vulnerable to tuberculosis and less adaptable when infected than others. The main problem in treatment was to get the patient to see his case in the proper perspective. Over-compensation for a physical defect accounted for many of the foolish risks which tuberculous patients often took—breaking sanatorium rules, drinking too much, taking violent exercise, and so on. An understanding of the psychology of these people would often make it possible for the doctor to explain to them the mechanism of their behaviour and so obtain better coöperation.

Dr. A. A. W. PETRIE (medical superintendent, Banstead Mental Hospital), considering the effect of tuberculosis on the mentally disturbed patient, said that it was easy to mistake some of the manifestations of anxiety neurosis for those of tuberculosis, since they included loss of weight, palpitation, and heavy sweating. He had analysed the type of major mental disorders occurring in the 126 cases of pulmonary tuberculosis in one institution for certified mental cases during the past decade. Nearly two-thirds of these were schizophrenic or manic-depressive cases with the melancholic type predominating. Cases with the shallow type of breathing were ideal subjects for infection with the tubercle bacillus. The habits and tendencies of schizophrenics with their shallow breathing and inert respiratory centre predisposed them to such infection, and work by Offler and Luxenburger showed that this lessening of resistance to tuberculosis was pronounced in the siblings of schizophrenics. At present more observations had been made on the mental state of psychotics who contract tuberculosis than on the mental states of those subject to tuberculosis. The tendency, if any, for tuberculous subjects to be liable to schizophrenia or other forms of mental disorder was less apparent and needed more investigation.

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE summer meeting of this association was held at the Nuffield Institute, Oxford, on June 25th, Dr. A. G. GIBSON presiding. Sir BERNARD SPILSBURY opened a discussion on the

Technique of Medico-legal Post-mortems

He pointed out the importance of thorough examination of the organs of the head, neck, chest, and abdomen, and, in certain specified conditions, of other parts of the body. External inspection was a very important part of the examination. Sir Bernard described methods of recording injuries and of searching for hidden bruises by incision of the skin.

He outlined a routine for removal of the organs to ensure that no important structure should be overlooked; this routine could be modified as required—for example, in infants where all the structures from the floor of the mouth to the pelvis could be removed in one mass. The method of examining the brain and also the dissection of the neck used in cases of strangulation or cut-throat injuries were detailed.

Sir Bernard pointed out the importance of opening up the heart while it was still attached to the lungs and of opening the intestines from end to end, noting the character and distribution of their contents. Finally he described the method of removal in one mass of the pelvic organs and their examination in cases of suspected abortion.

Dr. A. H. T. ROBB-SMITH read a paper on the uses of

Fresh Preparations in Post-mortem Work

He illustrated the use of such preparations in the identification of fat emboli, of pigments, and of deposits in the kidneys. For the recognition of fat emboli a small snippet of lung tissue was taken on a slide and moistened with 2 per cent. potassium hydroxide; a coverslip was applied and the preparation was examined with a partially closed condenser diaphragm. The pulmonary tissue was rendered transparent, though the elastic fibres were not dissolved. The fat was seen lying in the alveolar capillaries, either as cylinders or as droplets radiating in a fan-shaped manner. The fat could be distinguished from air bubbles since the latter had a broad dark rim with a bright centre, whereas the fat was uniformly colourless to the edge of the globule.

The application to fresh specimens of reagents such as acids, alkalis, hydrogen peroxide, and silver nitrate enabled a distinction to be made between hæmosiderin, hæmatoidin, malaria pigment, and melanin. These methods might be used also for the identification of small deposits in the pyramids of the kidney, which might consist of bilirubin, acid sodium urate, sodium biurate, or calcium carbonate. Bilirubin infarcts could be recognised by the characteristic rhombic or fine needle crystals and by the use of Gremlin's reaction. This was carried out by rinsing thin slices of the kidney in weak potassium hydrate, applying a coverslip, and placing a drop of strong nitric acid at one side and drawing the solutions through with blotting paper. The bilirubin deposits might be seen to change colour from green, through red, to blue. Uric acid infarcts had usually an amorphous form and were soluble in dilute acids without the formation of gas. Calcium carbonate infarcts could be recognised by the formation of needle-shaped calcium sulphate crystals on the application of strong sulphuric acid, or calcium oxalate crystals after the addition of hydrochloric acid and ammonium oxalate. They were also soluble in hydrochloric acid with evolution of carbon dioxide. Gouty deposits of sodium biurate were recognised by their characteristic crystalline form. Dr. Robb-Smith did not advocate the use of unfixed frozen sections as these seldom supplied information which could not be obtained from a careful observation of the gross characters of the organ.

Dr. ERIC WORDLEY opened a discussion on

Status Thymicolymphaticus

He said that the older text-books gave a definite description of a condition characterised by

enlargement of the thymus and lymphoid tissues associated with sudden heart failure and death. They accepted the association between such post-mortem findings and sudden death without any reservations, except to say that it was difficult to explain exactly how and why death occurred. A joint committee had come to the conclusion that an enlarged thymus in itself could not be considered as indicating status lymphaticus, and that there was no definite evidence of general hyperplasia of lymphoid structures in cases with an abnormally large thymus. Dr. Wordley gave notes of seven cases in which the original criteria justifying a diagnosis of status lymphaticus were all present. In some cases an abnormal proportion of lymphocytes were found in films made from blood taken post mortem; this point deserved further investigation. He was inclined to the view that a diagnosis of status lymphaticus as the cause of death was justified in a limited number of cases. After some discussion it was decided to refer to the council of the association the question of undertaking a combined investigation of the cause of sudden death, without apparent reason, in persons with enlarged thymus and lymphatic glands and hypoplasia of the circulatory system.

Before the meeting a demonstration was arranged in the pathology department of the Radcliffe Infirmary. Dr. J. G. GREENFIELD demonstrated his method of removing the brain and spinal cord, Dr. A. H. T. ROBB-SMITH showed Graff's technique for removing the upper air-passages and pharynx, and Dr. A. G. SHERA demonstrated the value as a labour-saving device of an electrical rotary saw (made by Messrs. Wilkinson Ltd., 69, Cavendish-place, Eastbourne) for the removal of the skull-cap and exposure of the spinal cord in post-mortem work.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

AT a meeting of this society held in London on June 30th, with Colonel S. P. JAMES, F.R.S., the president, in the chair, a paper on

Hæmolytic Macrocytic Anæmia in Macedonia

was read by Dr. N. HAMILTON FAIRLEY. He began by considering the nomenclature, with special reference to "tropical macrocytic anæmia" as described by Dr. Lucy Wills. He thought it difficult to describe these cases seen in Macedonia as tropical, seeing that they occurred in Europe, and perhaps the hæmolytic character conspicuous in the majority of them should differentiate them from the cases described by Wills and other workers. He believed, however, that nutritional deficiencies played an all-important part in their ætiology, as they did in Dr. Wills's cases, and he thought the term "nutritional macrocytic anæmia" might be used to cover both the cases seen in Macedonia and those reported from India and elsewhere.

Dr. Fairley then described in detail the symptoms and clinical findings in a group of 40 cases he had recently investigated among the refugee population in Macedonia. The condition was seen in its most severe form during pregnancy, beginning gradually about the second month and suddenly becoming acute in the latter months. After delivery recovery was usually rapid. More chronic forms were seen in males and non-pregnant women. The symptoms were those associated with profound anæmia. On examination the patients appeared strikingly well nourished, and the teeth, tongue, and nails showed no abnormality. The complexion was muddy and sometimes lemon-tinted with jaundice of the sclerotics. Purpura and bleeding from the gums were important and constant findings. There was an increase in plasma bilirubin and in the excretion of pigment. Fæcal fat was normal and normal glucose-tolerance curves were found. In 22 cases examined by test-meal there was free hydrochloric acid in the stomach. The spleen and liver were much enlarged and in the terminal stages severe congestive heart failure was common. The high blood-urea sometimes present Dr. Fairley attributed to excessive cell destruction rather than to faulty renal function, since albuminuria and casts were not found. He had seen no lesions of the central nervous system. The anæmia in 37 cases proved to be macrocytic and hyperchromic, with evidence of increased hæmolysis. One case, following antisyphilitic treatment, was aplastic and macrocytic and one seen in the puerperium after severe post-partum hæmorrhage was microcytic. He commented on discrepancies he had found between estimations of cell volume and cell diameter, the cells often having a normal diameter but an increased volume. This discrepancy was evident when the slides were stained with Jenner stain but not when stained with Leishman. Examination of marrow removed by sternal puncture showed an increase in the number of primary erythroblasts and some megaloblasts of Ehrlich. Abnormal myelocytes were also a striking feature of marrow films. He had noticed, too, definite involvement of the megakaryocytes. Bizarre forms were always present and this probably accounted for the thrombocytopenic manifestations. Describing the autopsy findings, Dr. Fairley thanked Dr. G. R. Cameron for his reports. The liver showed the histological picture of a nutmeg liver. There was also great hypertrophy of the reticulo-endothelial cells, which were loaded with pigment. Similar hypertrophy was found in the spleen. The bone-marrow was hyperplastic. The patients responded to liver extracts, giving a leuco-erythroblastic type of picture as soon as therapy began. Far larger doses of Marmite or liver extract were necessary than had been used by Dr. Wills. An analysis of the diets in Macedonia showed that most of this refugee population suffered from lack of animal protein. The vitamin-C content of their food appeared adequate. Dr. Fairley thought that in the majority of cases two factors were probably involved: (1) splenic enlargement, following malarial infection, with hypertrophy of the reticulo-endothelial system and consequent excessive destruction and phagocytosis of normal red cells; (2) deficiency of certain substances necessary for red-cell maturation. The two factors together produced a severe macrocytic hæmolytic anæmia.

Dr. LUCY WILLS said she thought the name "nutritional macrocytic anæmia," as an inclusive title for the Macedonian type and the type she had described in India and other workers elsewhere, was a good one. She believed that excessive hæmolysis probably occurred in certain of the Indian cases, but she herself had always excluded such cases from her investigations, regarding them as examples of acquired acholuric jaundice. She had been staggered by the large doses of liver extract used by Dr. Fairley and thought the red-cell response obtained had been poor, suggesting the presence of some complicating factor. She had found the same discrepancy between cell volume and diameter measurements in certain cases, especially when Jenner stain was used, and was

inclined to attribute it to some alteration in the plasma of severely anæmic patients.

Dr. JANET VAUGHAN thought it unwise to accept the discrepancy between cell volume and diameter as dependent upon some staining peculiarity. She had been interested in certain cases of mild anæmia in pregnant women in this country who showed similar discrepancy between the two measurements and an increased red-cell fragility.

Prof. L. E. NAPIER believed that in many cases of pregnancy anæmia in India the underlying macrocytosis was masked by the severe degree of microcytic anæmia widespread among the population. It was difficult for the small cell to become as big as the cell accepted in England as macrocytic even when there was a deficiency capable of producing macrocytosis.

Dr. G. FRASER said that in Assam anæmia of the type described by Dr. Hamilton Fairley (except that purpura was absent) was the disease with the highest mortality-rate. Unless the cases were treated as early as the fourth month of pregnancy Campolon was unsuccessful. Transfusion or induction was then required.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this society was held in Newcastle-upon-Tyne on June 17th.

Absence of Vagina

Prof. FARQUHAR MURRAY described the treatment of a case of absence of the vagina in a girl aged 13.

The space between the rectum and vagina was first opened up and packed with gauze from below. The abdomen was then opened to disclose the presence of a hæmatometra. The uterus was opened and the bladder pushed down, revealing a patent vaginal vault attached like a cap to the cervix. A passage was then made with dilators between the vaginal vault and the perineal wound. After the operation menstruation became normal. Dilators were passed for some months but stenosis recurred nine months after the operation and again caused retention of the menses, so that dilatation had to be done again in hospital. The patient now menstruates regularly and in comfort.

Dr. JOHN CHISHOLM (Sheffield) suggested that a mould and skin graft might be used.—Dr. J. E. STACEY (Sheffield) held that most of these cases were due to infantile infection and not to developmental faults. He described a case of complete secondary occlusion of the lower half of the vagina in a parous woman aged 45, which caused intermittent hæmatometra; it was due to an attack of gonorrhœa.—Mr. ST. GEORGE WILSON (Liverpool) described a similar case in which the McIndoe operation had failed completely, mainly because of the difficulty in cutting a large enough skin graft.—Mr. F. E. STABLER described a case of imperforate hymen in a girl who had feigned periods to her mistress. This girl was believed to have a single uterus, but what was thought to be a uterus was found at operation to be a pelvic kidney and no treatment was practicable.

Action of Leucocytes

Dr. C. G. PAINE (Sheffield) showed a film entitled White Cells in Action. The first part of the film showed the apparatus.

It consists of a large tank, heavily lagged with asbestos, and thermostatically controlled. From this, water is pumped through an external circuit to the microscope warm stage. Within the warm stage is a small glass chamber containing the nutrient fluid and the cover-slip upon which the leucocytes are mounted. The technique for obtaining living leucocytes is as follows: a drop of blood is allowed to clot on a cover-slip and incubated at 37° C. in a moist chamber; after 30 minutes' incubation the clot is flicked off, and after the residue of red cells has been removed by rinsing in saline, the cover-slip is mounted on the warm stage.

The second part of the film showed the movement of normal leucocytes, exhibiting how all activity is initiated by the development of the "hyaloplastic foot." Streptococci were introduced and it could be seen how phagocytosis was effected by extrusion of the hyaloplastic foot. A "boiling effect" in the granules after phagocytosis was very striking. After exposure to larger quantities of streptococci the leucocytes are no longer motile. The ingested organisms are arranged around intracellular vacuoles—presumably an attempt at tryptic digestion after phagocytosis. After massive phagocytosis the cells are killed and agglutinated; this is the earliest stage of pus formation.

The leucocytes were then shown exposed to a solution of a protein substance dissolved off the surface of the streptococci. The organisms employed were Group A hæmolytic streptococci, belonging to Griffith's Type 3. The protein substance was the chemical fraction responsible for type specificity, and it was seen to have a lethal effect on leucocytes.

Dr. W. R. ADDIS (Manchester) read a paper on two cases of pseudomyxoma peritonei. He thought the term should be confined to cases in which there is an ovarian lesion; otherwise the condition should be called mucinous peritonitis.—Mr. ST. GEORGE WILSON described a case of carcinoma of the vagina secondary to carcinoma of the colon, and Prof. MURRAY reported a case in which a nullipara had a large sloughing fibroid with cellulitis and bilateral white leg.

PREVENTION OF EYE INJURIES

FOR some time the number of industrial accidents treated at the Royal Eye Hospital, London, has been steadily increasing—there were 6500 in 1935, 7400 in 1936, and 7700 in 1937—and about three months ago the hospital authorities set up a committee which included representatives of the hospital staff and council, the National Safety-First Association, the Home Office, and Members of Parliament to consider ways of checking the increase. By way of bringing the various safety appliances to the notice of working men examples of the main types have been exhibited in the out-patient hall, and on June 22nd the hospital extended their campaign by a more comprehensive exhibition of preventive measures. The exhibition was opened by the Earl of Athlone, who congratulated the hospital on the lead it was giving to other institutions throughout the country in this important work. A cinema film was then shown which had been made in the hospital wards and in neighbouring factories and which illustrated the use of protective appliances in industry and the methods of treating injuries at the hospital. The exhibits included the different kinds of goggles and screens designed for such occupations as grinding, oxy-acetylene welding, and riveting, and the metal-sputtered goggles, glare- and dust-proof, which are used by pilots of the Royal Air Force and Imperial Airways. The strength of lenses made of toughened glass was demonstrated by the makers, who showed that a metal ball weighing ½ oz. could be dropped on such a lens from a height of 6 ft. without damaging it. Photographs were also shown on the walls of the safety measures in use in well-known factories. Part of the exhibition is to remain in the casualty department as a permanent museum.

REVIEWS AND NOTICES OF BOOKS

Pneumonia and Serum Therapy

Revised edition. By FREDERICK T. LORD, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; and RODERICK HEFFRON, M.D., Field Director, Pneumonia Study and Service, Massachusetts Department of Health, 1931–35. New York: The Commonwealth Fund; London: Humphrey Milford, Oxford University Press. 1938. Pp. 148. 4*s*. 6*d*.

THE revised edition of this book—from the title of which "lobar" has been dropped since specific therapy is now being applied to cases of atypical and broncho-pneumonia—is larger by 57 pages than its predecessor published in 1936. New data have been added on the incidence of the higher pneumococcus types (IV–XXXII) in lobar and broncho-pneumonia and the pneumonias of children, and on the fatality of infections due to the more common of these types. The figures on the treatment of types I and II pneumococcus infections have been enlarged, and the various American reports on the treatment of pneumonia due to types V, VII, VIII, and XIV have been collected and are presented as a whole. Reference is made to the preparation and early clinical trial of therapeutic rabbit sera. We have as yet no figures in this country to contrast with the American findings regarding the relative frequency of the higher pneumococcus types in pneumonia, but available data suggest that infections with the epidemic types I and II are much more common in the industrial towns of the north of England and Scotland than they are in London. It is to be hoped that the encouraging reports from America on the treatment of pneumonia due to some of the higher types and the prospects of a cheap and concentrated rabbit serum will encourage investigators here to explore the possibilities of applying these new therapeutic measures. It is, of course, now possible that the recent strides in chemotherapy may obviate the need for specific therapeutic antisera in lobar pneumonia, but even then, as Prof. A. Fleming points out on another page, these may be desirable adjuvants. In the meantime this small book provides a most useful and up-to-date compendium on the methods and results of serum therapy.

A Method of Anatomy

By J. C. BOILEAU GRANT, M.C., M.B., Ch.B., F.R.C.S. Edin., Professor of Anatomy in the University of Toronto. London: Baillière, Tindall and Cox. 1938. Pp. 650. 27*s*.

SINCE the beginning of the century a number of books on anatomy have presented, with more or less success, details of structure in relation to the principles apparently concerned in their arrangement. This plan has been adopted here, and Prof. Grant has made a praiseworthy effort to explain to the student the reason why he finds things as they are within the body. The text is simple and lucid and the diagrammatic figures are very clear. The study of anatomy, apart from the need to memorise the essential facts, is, after all, mainly an exercise in common sense, and any descriptive work which encourages the student to use his reasoning powers, and also reminds him of the development of the parts of the body he is studying, will help him to learn his work. The author lays proper stress on the developmental aspect of anatomy in this book, and in future editions might with advantage focus the student's attention on it to an even greater extent.

We note the persistence of such curiosities in terminology as the "snuffbox"—surely not adopted in the Birmingham Revision. A student who remembers that the radius is in contact continuously with the humerus will hardly be able to accept the common teaching, here repeated, that in falls on the hand the lateral bone can transmit a strain through the interosseous membrane to the ulna. Similarly, the explanation of injuries in the shoulder region, which entails the assumption that the humerus moves up under the acromion, will hardly appeal to those who know the detailed anatomy of the joint and its relations.

While providing a short but adequate account of the autonomic nervous system, Prof. Grant does not include the anatomy of the brain and cord in his book, an omission which should be rectified in future issues. These parts lend themselves well to the method of which this book is an example.

British Encyclopædia of Medical Practice

Vol. VII. By Various Authors. Under the general editorship of Sir HUMPHRY ROLLESTON, Bart., G.C.V.O., K.C.B., M.D., D.Sc., Emeritus Professor of Physic, Cambridge. With the assistance of Prof. F. R. FRASER, M.D., F.R.C.P.; Prof. G. GREY TURNER, M.S., F.R.C.S.; Prof. JAMES YOUNG, D.S.O., M.D., F.R.C.S.E.; Sir LEONARD ROGERS, K.C.S.I., F.R.C.P., F.R.C.S., F.R.S.; and F. M. R. WALSHE, O.B.E., M.D., D.Sc., F.R.C.P. London: Butterworth and Co. 1938. Pp. 718. 35*s*.

THIS volume, which follows the same general plan as its predecessors in this series, contains 50 authoritative articles on subjects ranging from hyperchlorhydria to leucorrhœa. In the sphere of general surgery Nils L. Eckhoff's exhaustive survey of intestinal obstruction is obviously an article of first importance. The use of small doses of morphia, at one time erroneously supposed to inhibit peristalsis, is herein advocated as a means of providing the rest urgently required by patients suffering from paralytic ileus. Intravenous hypertonic saline and the administration of a spinal anæsthetic are measures further recommended in the treatment of paralytic ileus of sympathetic origin. Such procedures are unquestionably more rational than the older ones which all too often savoured of flogging a tired horse. A contribution by James Young and Meave Kenny on normal labour covers adequately this none too familiar ground. Those with extensive experience of domiciliary midwifery may regard the counsel to repair all intravaginal tears, however small, with catgut sutures as one of perfection, especially now that the bogy of puerperal sepsis has been so largely laid by the introduction of drugs of the sulphanilamide group. James Young further collaborates, this time with B. Rait-Smith, in an article on anæsthesia and analgesia in which the advantages in obstetric practice of nitrous oxide, administered through Minnitt's or Moir's apparatus, over chloroform or ether are explained. J. C. Bridge's article on lead poisoning describes the modern medical treatment of this condition as advocated by Aub and Hunter. This consists essentially first in the immobilisation of lead in the bones by means of a high calcium diet, and secondly, in a gradual process of de-leading by means

of a low calcium diet, together with the administration of ammonium chloride and parathyroid extract. The special departments also are well represented in this volume. An interesting dermatological article is one by M. Sydney Thomson on keloid which he regards as a fibroma of the skin best treated by radium. The statement that spontaneous regression of keloid is rare may come as a surprise to some readers. Alec Rodger, writing on intelligence tests, sets out three objections commonly urged against the use of these tests: (1) that they are tests of knowledge rather than intelligence; (2) that the time factor may have an upsetting effect on nervous subjects; and (3) that tests of the verbal type give an unfair advantage to those accustomed to the solution of abstract verbal problems. Meeting these charges, Rodger argues that the third is the most serious and claims that non-verbal "performance" tests substantially succeed in meeting this objection.

Phenomenon of Local Tissue Reactivity

By GREGORY SHWARTZMAN, M.D., Bacteriologist, Mount Sinai Hospital, New York. London: Humphrey Milford, Oxford University Press. 1937. Pp. 461. 34*s*.

THIS book gives a full account of researches by Dr. Shwartzman and other workers on the phenomenon which bears the author's name. In the basic experiments described in the introductory chapter rabbits were injected intradermally with Berkefeld filtrates of *Bact. typhosum* cultures. Preferably 24 hours later an intravenous injection of the same material was given, and within a few hours there followed at the site of the intradermal injection a severe reaction characterised by massive hæmorrhage and necrosis. It was soon found that this phenomenon was not peculiar to *Bact. typhosum* but was shown by a wide variety of organisms, and that unrelated organisms could be used for the first or preparatory, and for the second or provocative injection. The relation of the phenomenon to true anaphylaxis, to bacterial allergy, and to hæmorrhagic diathesis is discussed, and its nature is clarified by these comparisons. Of its existence as an experimental fact there can be no doubt, but the author's interpretation of its significance is open to question. Briefly, he believes that it throws new light on the mechanism whereby pathogenic bacteria produce their harmful effects. Certainly the factors responsible for the phenomenon resemble the known exotoxins in certain important respects: they are antigenic, they can be specifically neutralised by immune sera, and they are capable of giving rise to an active immunity in rabbits. There are however many disturbing non-specific features about the phenomenon which make it hard to believe that it plays the important rôle claimed for it in the mechanism of bacterial virulence and antibacterial immunity.

The Negro's Struggle for Survival

A Study in Human Ecology. By S. J. HOLMES, Professor of Zoology in the University of California. Berkeley: University of California Press; London: Cambridge University Press. 1937. Pp. 296. 13*s*. 6*d*.

As a biologist Prof. Holmes treats his theme from the viewpoint of one who observes the competition of two rival species inhabiting the same territory. He does not venture to forecast the size of the negro population in the United States in the year 2000, or even in 1950. His object is to examine dispassionately the various factors that may favour the future expansion of the negroes (including birth control amongst their white competitors) and on the other hand, the handicaps which tend to restrict their own numbers—their present high death-rate and high incidence of venereal disease which he believes to be their greatest enemy. Were it not for the latter the negroes, he thinks, would now be increasing at a more rapid rate than their white rivals and such an eventuality he regards as certainly possible, if indeed not probable. His discussion of the vital statistical material and the extensive American literature on this subject is clear and interesting. Some of it has a distinct appeal to those who are not particularly interested in population trends. The differential incidence of infectious diseases on the white and coloured has a bearing on epidemiology, and Prof. Holmes's chapter on the selective action of disease well deserves study by sociologists.

The Generations

A Study of the Cycle of Parents and Children. By EMANUEL MILLER, Psychiatrist to the West-End Hospital for Nervous Diseases. London: Faber and Faber. 1938. Pp. 276. 7*s*. 6*d*.

THIS stimulating book is not nearly long enough. Dr. Emanuel Miller lets loose hundreds of hares, all equally plump, enticing, and agile, and excites his reader into dashing from one to the other. This is hardly Dr. Miller's fault; a survey of the relations of parents and children embraces the whole of human destiny and he cannot be blamed if he finds it a lot to compress into eleven chapters and an index. After reading the good chapter on the background of marriage—men and women and their temperamental background—and the even better chapters on child character, puberty and adolescence, and the character of parents, it is perhaps ungrateful to wish that Dr. Miller would turn novelist and, confining himself to the vagaries of one family, tell us how a man like A might come to marry a woman like B and have such curious children as C and D. Really, of course, he deserves to be thanked for supplying in small compass many facts and much material for speculation. Moreover, mastering the schizoid nature of his theme, he achieves a synthesis in the chapters on the prophylaxis of the family and on its future. His suggestions here, as might be expected, are sound and kindly. The much discussed problem of homosexuality during adolescence he regards, to some extent, as a product of sexual segregation and long periods away from home; co-education may provide a partial solution. When the young man or woman comes to choose a mate, Dr. Miller commends "the readiness that mothers may show in making early efforts to cut the spiritual umbilical cord which attaches their sons and daughters to them." He explains the value of a neutral arbiter when a marriage shows signs of breaking down, and he advises repeatedly a system of training for the child which will free him from the unconscious fears and conflicts which beset him. Society is still governed less by man's rational will than by the unconscious forces which tie us to primitive anchorages. He holds that "it is only by rendering these unconscious forces more and more conscious by the early liberation of the child that the rational will can prevail." And that, after all, is what we all want.

THE LANCET

LONDON: SATURDAY, JULY 9, 1938

OLD AGE IN MIND AND BODY

Das Alter ist ein höflicher Mann,
Einmal übers andere klopft er an,
Aber nun sagt niemand: herein!
Und vor der Tür will er nicht sein.
Da klinkt er auf, tritt ein so schnell
Und nun heisst's, er sei ein grober Gesell!
GOETHE.

THE changes occurring in the human body in old age have received due attention from scientists and philosophers in the past, and much knowledge has accumulated about them; yet their underlying cause remains a mystery bound up with that of life itself. The vital factor which sets the limit to growth and development and determines the advent of decline has never yet been revealed. It is easy to adopt the sophism that it is life that consumes the body, and that natural death marks the exhaustion of a store of energy; but this explains nothing, since it is not necessarily those who live strenuous lives who die young. Sometimes it seems as if strenuous living generates the energy for life, for we see men of the highest attainments, particularly in the intellectual world, living far beyond the average span with no apparent decline in their intellectual faculties, and it is to such men that we owe much of our knowledge of old age. Prof. LUDWIG ASCHOFF, who at 71 remains as commanding a figure as ever in the world of pathology, and is at present a welcome visitor in this country, has recently completed[1] a critical review on the morbid anatomy of old age which should clear away much confusion. He dismisses the saying *Senectus ipsa morbus* as seldom applicable to man. In his own long experience he has never found a case of purely natural death: autopsy has always revealed some pathological process as a cause. Sometimes, however, he has noted that disease may be less distressing in its effects on the aged, and he recalls the "unexpected" death at the age of 97 of a colleague only two days after he himself had seen and talked with him. Here ASCHOFF expected to find a case of natural death, for there had been no sign of illness, but at autopsy a severe lobar pneumonia of 4 or 5 days' standing was found together with numerous metastases of a malignant tumour of the thyroid. This old physician, who was well qualified to appreciate his physical state, had suffered little discomfort and had apparently been unaware of his condition. The saying "A man is as old as his arteries" might well apply if arteries were man's only important tissues, but as ASCHOFF points out, man is an intellectual being. His effective life depends on his mental capacity, and that cannot be measured by morbid anatomy. The period of a man's life can only be estimated on his efficiency in the struggle for existence. In their life-history all tissues pass through successive phases of evolution, maturity, and involution or decline, but these phases vary in their duration and they do not necessarily synchronise in any indiviual. Growth and development of the arteries, for example, usually ceases at about the age of 33, and the changes associated with old age usually begin to appear about 10 years later. This short period between development and decline may be regarded as the prime of life so far as the arteries are concerned; yet the prime of a man's life as judged by his period of high independent adaptability to the external conditions of life, often extends well beyond the 5th decade. The higher intellectual faculties seem as a rule to be relatively late in undergoing involution.

In considering the morbid anatomy of old age some distinction has to be made between changes which are essentially pathological processes and those which are purely senile. With old age there is a diminished resistance of the body to infection, and a less efficient adaptability to natural changes of climate, and it is such factors that influence the development of an accumulation of morbid changes which ultimately result in death. Arteriosclerosis or caries of the teeth occur so universally in old age as to be regarded as normal features of it; yet they are essentially pathological processes, influenced by external factors. Arthritis deformans and the like on the other hand are processes in a somewhat different class, and are regarded by ASCHOFF as pure decrepitudes; they are universal in old age and apparently as old in their incidence as homo sapiens. ASCHOFF believes with MARINESCO that with age there is a physico-chemical alteration in the tissues comparable with the dehydration of an old gelatin and expressed by an increased acidity. The sourness of old age, he remarks, may not be an entirely fanciful metaphor. He emphasises, however, that this applies only to the physical part of the process. Of the other part, that complicated organisation making up consciousness, we are still completely ignorant. We know that after death vital functions cease, and decay of the elementary substances sets in, but the difference between living and dead substance no one can presume to define. So long as we do not know what life is founded on, we cannot know the fundamental cause of its end.

These reflections are set out in general terms in the first of the series of contributions which the *Medizinische Klinik* has published at intervals during the 18 months between January, 1937, and June, 1938. The introductory survey was followed by detailed examination of the causes of death in old age and of its effect on the structure and function of various systems of the body. ASCHOFF notes that though the wear and tear to which individual organs are subject begins as early as birth, it is not until old age that their cumulative effect becomes apparent. He shows why the success of attempts at rejuvenation must be evanescent. There is no remedy for old age. Whether it comes soon or late depends less on the

[1] *Med. Klinik*, June 10th, 1938, p. 773.

degree of wear and tear we are submitted to than on our inborn resistance to it. Prof. ASCHOFF goes beyond the scope of morphology in his conclusion [1] that the one consolation old age can bring with it is the consciousness of having used the allotted span of life for the advancement of mankind. Those who know his work—and they include all interested in scientific medicine—will rejoice that he himself, despite the humility with which he writes, must be aware of the extent of his own contribution to human welfare.

URÆMIA AFTER TRANSFUSION

SUPPRESSION of urine leading to uræmia and death in from five to ten days has long been recognised as one of the sequelæ of the transfusion of incompatible blood. At least five theories have been proposed to explain the mechanism of its production. Baker and Dodds,[1] following up the suggestions of Yorke and Nauss [2] as to the causation of renal failure in blackwater fever, provided sound evidence for their belief that the anuria is due to mechanical blockage of the renal tubules with hæmatin derived from the hæmoglobin of the lysed red cells. They showed that in acid urine hæmoglobin is readily convertible into insoluble hæmatin. Baker [3] has since observed that the same mechanism may produce anuria after transfusion of red cells which although compatible have been damaged by overheating. The work of Richards and Walker,[4] who noticed that in the amphibian kidney at any rate it is not until the glomerular secretion has reached the tubules that it becomes acid, offers a possible explanation of why the blockage with hæmatin takes place in the tubules and not nearer the source of the urine in the glomeruli.

Although mechanical blockage of the tubules with precipitated hæmatin is certainly one of the causes of death in anuria after incompatible transfusion, examination of post-mortem material in fatal cases often fails to provide any histological evidence of such blockages and other possible explanations have been invoked. In some cases of severe urticaria transfusion has been followed by anuria and in these, as suggested long ago by Longcope and Rackemann,[5] the mechanism is probably anaphylactic. Depletion of the plasma chlorides has also been suggested as the cause of the renal failure; such depletion certainly occurs, but it seems more likely to follow than to precede the renal failure. The kidneys of human subjects dying after incompatible transfusion usually show some degree of tubular necrosis and on the strength of this the action of a hypothetical nephrotoxin has been postulated. Finally Mason and Mann [6] and later Hesse and Filatov [7] have found evidence of ischæmia of the kidney which they attribute to vascular constriction after infusion of hæmoglobin; and this condition also has been put forward as the cause of the renal failure. More recent observations suggest that this ischæmia is only a transitory phenomenon from which recovery is possible.

The subject has lately been reviewed by DeGowin, Warner, and Randall [8] following investigations on the kidneys of nine human beings who had died of renal failure after incompatible transfusion and of numerous dogs in which it had been experimentally induced by infusion of lysed canine red cells. The experimental material provided ample evidence in favour of the theory of Baker and Dodds; in the dog kidneys it was evident that death had resulted from simple obstruction of the renal tubules by precipitated hæmatin. None of the human kidneys, however, showed a similar picture; although in some of these a few pigment casts were found in the tubules, in others they were absent and in no case was there an accumulation likely to have interfered seriously with the function of the kidneys. Extensive deposits of hæmosiderin were found in many of the tissues, particularly in the epithelium of the renal tubules and the Kupffer cells of the liver. The renal tubular epithelium in many of the specimens showed considerable necrosis. As a result of their observations DeGowin and his co-workers are inclined to postulate two separate mechanisms in the causation of renal failure after incompatible transfusion: (1) mechanical obstruction of the renal tubules by precipitated hæmatin, and (2) necrosis of the renal tubular epithelium. In the production of this necrosis they suggest that the heavy deposition of hæmosiderin in the epithelium may play a part. They found that the extent of both forms of damage was enhanced if the urine was kept acid by the administration of ammonium chloride before and after the transfusion of hæmoglobin. Their observations serve to confirm the suggestion of Baker and Dodds that hæmatin is deposited only in an acid urinary secretion and to lend additional weight to their recommendation that after incompatible transfusion steps should be taken to render the urine alkaline.

THE NEW HOSPITALS CENTRE AT BIRMINGHAM

NEXT Thursday the KING is to inaugurate in Birmingham a remarkable experiment. It is now more than eight years since a site beside the university buildings in Edgbaston was offered to the city for the building of a great new voluntary hospital sufficient to meet the city's growing needs and to nourish an adjacent newly constructed medical school. Years have passed in defining the needs and planning to meet them. And now the final touches are being put on a vast assemblage of buildings, each part of which has received the time and thought required to make it fulfil its purpose. The centre as it now stands dominates the university quarter and has a massive beauty of its own; the wide sweep of the tall

[1] Baker, S. L., Dodds, E. C., *Brit. J. exp. Path.* 1925, **6**, 247.
[2] Yorke, W., Nauss, R. W., *Ann. trop. Med. Parasit.* 1911, **5**, 287.
[3] Baker, *Lancet*, 1937, **1**, 1390.
[4] Richards, A. N., and Walker, A. M., *Amer. J. med. Sci.* 1935, **190**, 727; see also *Lancet*, July 2nd, 1938, p. 22.
[5] Longcope, W. T., Rackemann, F. M., *J. Urol.* 1917, **1**, 351.
[6] Mason, J. B., Mann, F. C., *Amer. J. Physiol.* 1931, **98**, 181.
[7] Hesse, E., Filatov, A., *Z. ges. exp. Med.* 1933, **86**, 211.
[8] DeGowin, E. L., Warner, E. D., and Randall, W. L., *Arch. intern. Med.* April, 1938, p. 609.

hospital block looks down the sloping ground right over the medical faculty buildings.

The centre as originally planned was to provide a complete hospital of 850 beds, 100 of them in a separate wing for paying patients, as well as a fully equipped out-patient department and a casualty receiving-room. Kitchens and offices have been provided on this scale, but the centre as at present constructed will accommodate only 500 patients, though the framework of an extra ward-block is already in being. Paying patients and out-patients must wait a while until more money is forthcoming. Throughout the long period of preparation it has been necessary to consider what effect the new centre will have on existing hospitals, both on their work and on their upkeep. The number of beds has been limited to its present figure because after searching inquiry the Birmingham Hospitals Council decided that an increase of 250–300 beds for acute cases would meet the requirements of the city for the next four or five years. It is true that between 1930 and 1935 the population of Birmingham grew by more than 2 per cent. and that 170 acute beds would be the corresponding increment. The municipal hospitals are admittedly sometimes crowded; there are too few maternity beds, and various departments of the voluntary hospitals speak of long waiting-lists. On the other hand the more effective use of hospital beds in these five years—a reduction in fact of the average patient's stay from 23 to 17 days—had already far more than compensated the growth of population; a very modest increase in the number of beds in a ward-block soon prevents overcrowding when the turnover is rapid; and cases refused admission at the voluntary hospitals have usually gained admission to one or other of the municipal hospitals.

Apart from such statistical adjustments the hospitals council has been confronted with a question of principle—whether each of the hospitals should be a general one, with a small number of units fully equipped with ancillary services for treatment and teaching, or whether all should have a complete flush less adequately maintained. Pædiatrics is already well served at the Children's Hospital and the suggestion has now been made that Queen's Hospital should absorb the Maternity Hospital and concentrate on becoming an efficient maternity unit. Of the two teaching general hospitals, the Queen's has some new buildings, but some of its sections are a hundred years old, and there is no room for expansion. If the Queen's ceased to provide medical instruction the General Hospital (built in 1896) and the Hospitals Centre would be left to develop general medical and surgical units, with the corresponding special departments. On this basis the hospitals council recommends that 200–250 new beds should be put into commission as rapidly as possible at the new centre, and as soon as these are in use the number of general beds at Queen's will be progressively reduced. The medical staffing of any new units is being left to the United Hospital in which the Queen's and the General have now been completely merged and which takes responsibility for beds at the centre as they become occupied. The medical committees of the United Hospital have not only given assurance that they are prepared to staff the various hospitals but hope to see their way to a pooling of the whole medical and surgical staff of the United Hospital with free interchange of personnel.

Difficulties there may well be in working out a scheme of this magnitude, not least that of finding sufficient nursing staff. It is stated that nurses recruited for the Centre have already been absorbed elsewhere and there is a talk of the wider use of male orderlies to fill the gaps. Of good augury is the harmony of purpose between the civic authority and the voluntary hospitals, based on the survey of needs which has been drawn up in the closest collaboration. It was agreed at the outset that hospital accommodation for the "acute sick," apart from statutory obligation for infectious disease and destitution, was to be provided by voluntary means supplemented as occasion arose by the local authority. Birmingham has long been recognised as the home of effective self-government and the scheme to which Royal assent is shortly to be given is a notable landmark in its history.

STAMMERING

INTEREST in speech therapy has been growing in recent years and clinics have been provided by some hospitals and by a certain number of education authorities, both in London and the provinces. Stammerers form the larger proportion of the cases submitted and it is therefore unfortunate that about the treatment of this particular defect there is no complete agreement, either in theory or practice. The problem is, as one writer has expressed it, whether stammering should be dealt with at a psychological clinic or an elocution studio. The trend of opinion at present is towards the former, but there are still ardent advocates of the latter.

There is a general consensus that stammering is not due to any anatomical defect. It is functionally an incoördination of the factors involved in the production of speech—a disintegration, as Travis has described it, of the continuous rhythmical flow of speech. Everyone has observed also that stammerers may display an element of fear, often of considerable degree. Both sides admit a physiological and a psychological aspect, but differ in the estimate of their relative importance. Mr. St. John Rumsey, speech therapist at Guy's Hospital, contends[1] that the essential cause of the intermittent breakdown is "lack of control of the vocal cords, which are often very widely divided when they should be approximated, or they are pressed so firmly together that no sound or breath can pass between them." On this view the necessary concentration of the singer on vocal tone accounts for the disappearance

[1] *Practitioner*, December, 1937, p. 709, supplemented by a recent book entitled Clear Speech (London: Frederick Muller. 3s. 6d.).

of the stammer in singing, and speed also is a determining factor affecting speech control. With respect to fear, Mr. Rumsey goes so far with the psychologists as to admit that whether a stammer is caused by fear or is its cause "is a moot point," but obviously his own sympathies are against the psychological theory, and excessive speed is in his view often the only cause. Other writers, Seth and Guthrie, Boome and Richardson, as well as Dr. E. N. Snowden in his article in this issue (p. 117), emphasise fear and muscular tension as the most outstanding features of the stammerer and base on these their advocacy of the restoration of self-confidence and muscular relaxation as the sheet anchors of treatment. Snowden would obtain relaxation by removing the causes of emotional strain and would restore self-confidence by progressive exercises—such as acting a part or reciting—which the patient can carry out without difficulty. Mr. Rumsey admits the necessity for relaxation of muscles hindering tone production and resonance but insists on the need for concentrating on the muscular control of the vocal cords, a process which he considers will not be helped by general muscular relaxation. Fear too, he contends, disappears with gain of control. Both sides claim success for their methods.

The "relaxation" school admit that a long period may in some cases be necessary for cure. The elocutionary methods generally give more rapid results, and relapse, when it occurs, is often more the fault of the patient than the method. Probably the truth is that both psychology and physiology must be considered. The therapist who accepts the physiological theory will even unconsciously suggest self-confidence to the timid stammerer and the relaxionist may accelerate his cures by some training in elocution to correct the bad speech habits which the stammerer almost always develops. The psychologist admits the success of different methods and explains it by regarding stammer as a disorder of behaviour with unconscious motives which, even when unrecognised, may respond to any treatment that chances to touch a responsive chord. Analysis, generally of adults, throws light upon the individual elements of a stammer and may find complications that are not covered by any simple theory.

ANNOTATIONS

POST-OPERATIVE CORONARY THROMBOSIS

THE association of operation and coronary thrombosis, which has been noted in the past by several authors, assumes further significance now that surgical measures are being advocated for the treatment of angina pectoris. In 35 cases of post-operative coronary thrombosis observed at the Mount Sinai Hospital in New York during the years 1931–37 Master, Dack, and Jaffe [1] found several cogent reasons to support the belief that the operation precipitated the attack. First, in half the cases the thrombosis happened within three days of the operation, and in six within twenty-four hours. Secondly, in these seven years coronary thrombosis occurred only four times among patients who had been in the medical wards for long periods, and Master and his colleagues contend from the lowness of this figure that in their post-operative cases the original illness and rest in bed were unlikely to be factors in the production of the thrombosis. Thirdly, the total number of patients treated for coronary thrombosis was 625, and therefore the 35 proved attacks following operation represented a significant incidence of 5·6 per cent. The actual incidence was undoubtedly greater, for the authors excluded 13 additional probable cases because of lack of post-mortem or electrocardiographic evidence and also several cases in which thrombosis took place after the third week, although the attacks might have been related to the operation. The average age of their patients was 62; twenty-two were over 60 and only four were under 50. Evidence of moderate to severe coronary sclerosis appears to have been found in most of the cases, but the paper is not clear on this point. The operations varied in type from lumbar puncture to gastrectomy, and in duration from ten minutes to several hours. No particular form of anæsthesia was incriminated. Of the 35 patients 23 died, and in 8 of these death was the direct result of the thrombosis. Shock, tachycardia, dehydration, and infection are cited on theoretical grounds as factors associated with operation which might precipitate coronary thrombosis. Surgical shock was present in more than half of the cases, but only five times did thrombosis manifest itself during the stage of shock. The authors in conclusion plead for further study of these possible causative factors, which may lead to the formulation of criteria for operation in elderly persons and measures to be employed during and after the surgical procedure. This much seems clear already, that, emergencies excepted, operation should not be undertaken in patients over 50 until they have been thoroughly investigated for coronary sclerosis, and that when this is present and operation is considered advisable in spite of it or even because of it, special care should be taken to minimise shock and dehydration and to avoid infection.

[1] Master, A. M., Dack, S., and Jaffe, H. L., *J. Amer. med. Ass.* April 30th, 1938, p. 1415.

PSYCHOLOGY OF A.R.P.

SPAIN is at present a field of research in methods of destruction and a book on his Spanish experiences by Mr. Langdon-Davies [1] contains one or two observations that may modify our ideas about air-raid precautions. Briefly, the current theory is that there will be an air-raid warning, after which the population will go to shelters, trenches, or gas-proof rooms, and stay there till the all-clear signal sends them about their ordinary business again. In Spain, however, this sequence of events is a thing of the past. The raids are made at irregular brief intervals of only an hour or so, and the attacking machine approaches *silently*, gliding a hundred miles with engines shut off. The first sound is the bomb explosion, followed (instead of being preceded) by the howl of the warning siren; next comes the roar of the anti-aircraft guns, and finally the all-clear. A brief respite; then suspense till the next bombs fall without warning. The use of the "silent approach" in dropping high-explosive

[1] Air Raid. By John Langdon-Davies. London: George Routledge and Sons. 1938. Pp. 143. 2*s*. 6*d*.

bombs increases both the risk of panic and the strain of suspense.

In modern war there are two fronts. At the military front men must in face of death work like parts of a machine; the attack must therefore pound them to bits physically. At the civil front the population must work like rational human beings; the object of the attack is therefore to immobilise them mentally and make them irrational. On this front there is a race between the attackers, trying to produce panic, and the defenders, trying to stave it off. Such is Mr. Langdon-Davies's conclusion and his recommendations show psychological understanding. The population, he says, confuse bombs with anti-aircraft fire and so feel the danger to be on all sides of them; so they must be taught the difference. Crowding together in a state of suspense creates a panic risk; so crowds must be working crowds not waiting crowds; and the warning must be a call to action since it will come too late for a flight to safety. The recommendations about London sound reasonable but would make a gigantic claim on our resources; for they take the form of evacuation camps (to be employed in peace-time as holiday resorts) and a vast underground system of roads. The thesis turns on the potency of high explosive and the silent approach in striking at the nerves of the civilian population and producing panic. Here as everywhere (as Dr. John Rickman argued in our issue of June 4th) we need to have a quantitative assessment of risks so far as this is practicable. The strength of the defence, he said, depends largely on everyone of us being kept informed and up to date.

HOW CAN THE NATIONAL DIET BE IMPROVED?

ALTHOUGH there can be no doubt that some—perhaps much—improvement of the national diet could be achieved without any radical change in existing incomes, it is now generally accepted that lack of purchasing power is the greatest part of the problem of poor nutrition. The foodstuffs rich in animal protein, vitamins, and minerals, which official and unofficial bodies daily exhort us to eat, are those which are in fact relatively expensive items of a diet and which must therefore be used sparingly when incomes are small. How to reconcile these two opposing demands is the subject of a memorandum issued this week by the Committee against Malnutrition.[1] It also enters largely into a more general, and in parts somewhat uncritical, review published by the British Association for Labour Legislation.[2]

There are, broadly speaking, three different ways in which the dietetic standards of the country might be improved:—

(1) The raising of incomes through higher wages or family allowances.

(2) The free or cheap distribution of particular foodstuffs, such as milk, to selected sections of the population.

(3) A reduction in food prices sufficient to bring them within the means of every family.

Dietetic studies carried out in Great Britain always show that on the average expenditure on the protective foods rises as the family income increases. On the other hand we cannot tell to what extent a general rise in the incomes of the lowest-paid and unskilled class would be devoted to such improvement of the diet. Such an increase in purchasing power would be only an indirect means of improving the diet, though, coupled with education, it would undoubtedly be a very desirable way. It would certainly not ensure what the Committee against Malnutrition calls "an adequate guaranteed diet to all sections of the community." In addition, without Governmental control of prices a general rise in incomes might well be nullified by a general rise in the cost of living, or the course of employment be affected. The economic factors are complex.

A scheme of family allowances has much to be said in its favour, for it is the larger families, on the whole, which are likely to suffer from deficient dietaries, and that at a period—in childhood—when a proper diet is especially important. But on this point the two committees differ considerably. The Committee against Malnutrition, though recognising the benefits of such a scheme, thinks it unlikely to allow of any considerable increase in family purchasing power and believes that it would prevent only the worst consequences of malnutrition. The British Association for Labour Legislation concludes that it offers more scope for improving nutritional standards than any other method of approach, and would like to see it thoroughly investigated, a conclusion we recently endorsed.[3]

Both committees dislike the element of the poor-law or charity that is at present involved in the free or cheap distribution of selected foodstuffs, as well as its dependence upon the whim or resources of the local authority. As at present regulated, such distribution, too, can reach only a proportion of those in need of better feeding, and is, to some extent at least, a curative rather than a preventive measure. The British Association for Labour Legislation would, however, like to see the provision of meals and milk in schools, whether free or not, considerably extended and ultimately form as much a part of the normal routine as the provision of education. If selection of recipients is to be made at all they regard an income test as preferable to the present very doubtful medical test—though clearly the poor-law element is thus emphasised.

The lowering of the cost of foodstuffs is not readily achieved. Unsubsidised production at low prices may not—often does not—repay the producer, or may encourage him to adopt mechanised methods and reduce the number of workers on the land—a result which can hardly be regarded with favour. Certain basic foods might have to be taken altogether out of the normal field of supply and demand, and marketed, perhaps, through public concerns. As the State already gives much assistance to agriculture in duties, subsidies, or other reliefs, it is not unreasonable, as one of these reports points out, that it should direct the incidence of this assistance to ensure the production of those materials which are most necessary for national welfare. And these foods, it is agreed, can be produced here to the advantage of British agriculture. The crux of the problem appears to lie in distribution and, as the Committee against Malnutrition admits, "the task of making food distribution a public concern would be far more complex than that involved in any of the public or municipal services hitherto established."

Clearly these different methods of improving the national diet are not mutually exclusive. Indeed it is certain that there can be no single-track line to

[1] Towards a National Food Policy. Pp. 8. 2*d*. post free from the Committee against Malnutrition, 19C, Eagle-street, W.C.1.
[2] Report on Nutrition. Pp. 118. 1*s*. 6*d*. British Section of the International Association for Social Progress, 55, St. Mary's-mansions, W.2.
[3] *Lancet*, 1938, **1**, 1452.

success. While the different means are pursued the opening paragraph of the report of the British Association for Labour Legislation may with profit be remembered: "the food taken must be digested, absorbed and assimilated; and this implies that it should be consumed quietly under agreeable circumstances and without a self-conscious computation of the several constituents in the diet." There is a risk of being too preoccupied with amino-acids, mineral elements, and vitamins.

This body is yet another to recommend the efficient pasteurisation of all milk.

THE MYXŒDEMA HEART

THOUGH the specific nature of the affection of the heart in myxœdema has only been generally recognised since the development of the electrocardiograph and the X ray, its existence was reported to the Clinical Society of London as early as 1888. From that time little was heard of the myxœdema heart until 1919 when Zondek and a little later Fahr emphasised that heart failure, associated with a characteristic enlargement of all the chambers of the heart, was common in myxœdemic patients. They also recorded the beneficial effects of specific therapy.

Two recent papers have defined the condition more clearly. Evans,[1] with serial radiograms, showed how the enormous dilatation of the myxœdema heart disappears with thyroid treatment and regresses when treatment is suspended. The main features of the electrocardiograms of his cases were the small P and T waves in all leads, which became normal with treatment. The electrocardiographic features of the cases of Stewart, Deitrick, and Crane[2] were similar: low Q R S complexes, low or inverted T waves, and occasionally prolongation of the P–R interval. They also describe the small Q R and T waves in the fourth lead. All the abnormal features diminished when thyroid was given and increased again when it was stopped. The investigators were able to demonstrate the effect of treatment on the basal metabolic rate, heart size, cardiac output, circulation time, and oxygen intake, and the oxygen usage of the tissues as indicated by the arteriovenous oxygen difference, and some interesting facts emerge from this intensive study. The lengthening of the circulation time in myxœdema was found to bear a linear relationship to the cardiac output as well as to the oxygen consumption, and the arteriovenous oxygen difference bore a similar relationship to the oxygen consumption and the basal metabolic rate. It is concluded from this that there is no failure of the peripheral circulation in myxœdema, and that the primary dysfunction is of the heart. Since the arteriovenous oxygen difference rose while the metabolic rate fell, it appears that the circulation to the tissues is inadequate. This Stewart and his collaborators regard as further evidence of a hypothetical circulatory stimulant, present in excess in the hyperthyroid state and lacking in the hypothyroid state. The existence of this stimulant was first suggested by Boothby and Rynearson[3] to explain their finding that the raised oxygen consumption of hyperthyroidism is accompanied by a greater increase in the circulation rate than that which occurs in the normal subject as the result of a corresponding rise in oxygen consumption due to muscular work. Their argument would be strengthened if it could be shown that the factors causing increased metabolism in hyperthyroidism could be legitimately compared with those causing the increase after muscular exercise.

The work of Stewart, Deitrick, and Crane makes it clear that the primary source of the circulatory embarrassment in myxœdema is in the heart itself, which performs less work per beat and per minute despite its increased size. The cause of the heart failure remains unexplained. Recent histological studies have failed to demonstrate the infiltration of the myocardium with myxœdematous tissue described by earlier workers, or to find any specific change in the muscle. Atheromatous changes are often found in the myxœdema heart and this may not be accidental, for the hypercholesterolæmia of myxœdema might well predispose to the development of atheroma of the coronary vessels. So common indeed is the association that some authorities advise that thyroid preparations should be given very cautiously, since an increase in metabolic rate and in the flow of blood through diseased coronary arteries might easily provoke angina pectoris. Speculations on the intimate causes of the myxœdema heart, however, are mainly of academic interest, for the fact remains that the condition can be recognised and cured.

[1] Evans, C., *Lancet*, 1937, **2**, 1300.
[2] Stewart, H. J., Deitrick, J. E., and Crane, N. F., *J. clin. Invest.* May, 1938, p. 237.
[3] Boothby, W. M., and Rynearson, E. H., *Arch. intern. Med.* 1935, **55**, 547.

DISTORTION INJURIES OF THE KNEE-JOINT

AMONG the internal derangements of the knee-joint produced by violence, tears of the cartilage are commonly operated on, whereas ruptures of the collateral and cruciate ligaments are usually treated conservatively by splinting and muscle stimulation. In distortion injuries the internal lateral ligament and the cruciates are most often damaged, and Ivar Palmer,[1] of Stockholm, advocates open operation and suture for their repair. In his experience the operation is not difficult and the results are good. He fixes the torn cruciates with coarse silk, which he draws through double canals bored obliquely through the femoral condyles or the upper end of the tibia and knots after the subluxation has been reduced. Although most distortion injuries happen to people engaged in the more active sports, Palmer holds that there is nothing inherently dangerous to the joint in the sports themselves. Trained muscles that respond quickly and keep the joint surfaces in accurate apposition are a perfect protection to the ligaments against overstrain. At winter sports during the ski-ing season distortion injuries of the knee are usually sustained by untrained people and by tired skiers who are not attempting anything dangerous but whose attention is diverted. Sports provide plentiful opportunities for such sudden diversions of the attention and it is then that the muscular protection momentarily fails and the ligaments are exposed to injury. It is often impossible to obtain a clear history of these accidents, but in diagnosis it is important to find out how the patient behaved afterwards. It is possible for a player to finish his game with an uncomplicated rupture of the internal lateral ligament, for the characteristic burning pain on the inner side of the knee is not immediately maximal but comes on slowly. When the internal ligament and the cruciates are torn, on the other hand, the patient falls helpless and falls again if he tries to stand. The elastic springy resistance to extension, which is typical of rupture of the internal ligament, is sometimes mistaken for locking of the joint, and the diagnosis from cartilage injury cannot always be made without an anæsthetic. In rupture of the cruciates the internal ligament usually gives

[1] *Acta chir. scand.* 1938, Suppl. liii.

way first and the capsule of the joint may also be severely torn. The tenseness of the joint may then provide a valuable clue to the diagnosis, for a tense hæmarthrosis is obviously incompatible with an extensive rupture of the capsule, whereas complete absence of distension will suggest a serious capsular lesion.

INTRAVENOUS MINERAL THERAPY

APART from the administration of salines, intravenous mineral therapy has never achieved widespread popularity. Iron is apt to be very toxic administered by this route except in very small doses, and there is no justification for giving it in this way since it can be taken so safely and effectively by mouth. Intravenous calcium therapy undoubtedly has its uses. No one who has seen 1 g. of $CaCl_2$ given intravenously to a case of post-operative tetany can forget the immediate relief of the patient. Intravenous calcium has been stated to be equally efficacious in lead colic and now its effects are being further explored. Lampson and Simeone have recently reported [1] favourably upon the results of trials of intravenous $CaCl_2$ in renal and gall-stone colic, spasm of the bladder, and post-operative distension. This form of therapy clearly deserves further attention. It must not be used in patients who are taking digitalis and if the chloride is being administered the greatest care must be taken to ensure that the needle is snugly in the vein. Probably, however, the use of the gluconate would eliminate this difficulty. Treatment is safe enough in normal persons provided the subjective feelings of the patient are used to guide the rate of dosage. Sensations of heat are inevitable but there should be no nausea and the administrator should remember that since there is a delay of several seconds between the injection and the onset of symptoms the drug must be given slowly and with great care.

CHEMICAL PROPHYLAXIS AGAINST POLIOMYELITIS

A YEAR ago we commented [2] on the application of chemicals to the olfactory area of the nose as a method of prophylaxis against poliomyelitis, and alluded to the work of Schultz and Gebhardt [3] who recommended the use of a 1 per cent. solution of zinc sulphate for this purpose. They now state [4] that, to obtain protection, it is probably necessary that the solution should be applied thoroughly enough to induce a temporary anosmia and in order to maintain the resistance it should be reapplied as soon as the sense of smell returns. On the other hand, no one wants such a functional effect to be permanent. The superior meatus is usually narrower and deeper in adults than in children, and so tends to hold solutions for a longer time. Hence the application causes pain of greater severity and longer duration in adults. Similarly, though in children the sense of smell seems always to return within a few weeks, it may take much longer in adults; indeed, Schultz and Gebhardt have learned of several adults in whom the sense of smell had not come back after more than six months. These considerations, together with their observations in monkeys that a rather severe exudative inflammation of the olfactory mucosa may be caused by the application, make them advise caution in its use until more is known about the mechanism of the protection given and about the risk of inducing permanent anosmia. Though they are continuing their investigations on monkeys, they admit that the full answer to the problem cannot be obtained from experiments on animals, and they ask for the experiences of any doctors who have used the method.

[1] Lampson, R. S., and Simeone, F. A., *Surg. Gynec. Obstet.* June, 1938, p. 975.
[2] *Lancet*, 1937, **2**, 203.
[3] Schultz, E. W., and Gebhardt, L. P., *J. Amer. med. Ass.* 1937, **108**, 2182.
[4] *Ibid*, June 11th, 1938, p. 2024.

SCHISTOSOMIASIS OF THE LUNGS

ALTHOUGH it is nearly thirty years since G. A. Turner drew attention to pulmonary schistosomiasis in man and some twenty years since Hamilton Fairley confirmed its existence in man and produced it experimentally in the monkey, the condition has had little attention. Yet Shaw and Ghareeb,[1] examining 282 bodies of persons with schistosoma infection (*hæmatobium* and *mansoni*) in Egypt, find that in more than 2 per cent. death was directly due to the damage to the lungs caused by the parasites. Moreover, in a third of all these infected persons parasitic pulmonary emboli had caused lesions. In 10 of the 95 persons thus affected the emboli had been worms, but in the main they were eggs. This proportion fits in with the opinion that the female worm oviposits daily; if the eggs are not held mechanically in the visceral vein in which oviposition takes place they may be carried through the right heart and filtered out by the thin-walled arterioles that accompany the bronchioles. Here by causing necrosis of the vessel wall ova will usually pass out into the surrounding tissues, and thus form a tubercle in the wall of the bronchiole or of an alveolus, the egg constituting a necrotic centre to the tubercle and the reaction being strictly limited in area. These enclosed eggs are, then, rarely found in the sputum. In 6 bodies there was, besides tubercles, focal degeneration of the wall of the arteriole, accompanied by an endothelial thickening obstructing the lumen; this thickening is vascular, and the effect of the obstruction is to cause dilatation of its contained capillaries into what the writers name an angiomatoid, together with hypertrophy of the muscular coat of the small arteries that lead up to it. Moreover there were 6 other persons, or 2 per cent. of all the cases, in whom, evidently as the result of intensive bombardment by ova, this arteriolar change was so widespread as to constitute Ayerza's disease; indeed it was accompanied by atheroma of the large pulmonary arteries and such hypertrophy of the right ventricle that its wall might be thicker than that of the left. In all 6 patients death was due to congestive failure of the heart, the formation of angiomatoids having failed to relieve the strain on the right ventricle sufficiently.

In addition there were, as noted, 10 persons in whom adult worms (nearly always dead males) had formed emboli. Reticulo-endothelial response with giant cells and a pneumonic exudate resulted in the enclosure of a now calcified worm by a fibrous capsule. As Fairley has shown, embolism of this kind is seen in experimentally infected monkeys which are not under treatment, and it will presumably occur in man when any worm which dies and gets loose in a vein has a clear runway to the lungs. But the effects of Fouadin in killing some of the dirofilaria worms which live in the right ventricular cavity of the dog, and in loosing them as pulmonary emboli, raises the doubt whether this is not one of the complications that should be in mind in the treatment of schistosomiasis by this and perhaps other antimony compounds, in cases where worms are not in the

[1] Shaw, A. F. B., and Ghareeb, A. A., *J. Path. Bact.* 1938, **46**, 401.

portal tract or where collateral circulation allows of by-passing the liver. By reason of the country where this work was done, *S. japonicum* did not come under observation, but it can hardly be doubted that a like investigation where it is endemic will give equally fruitful results.

OPTIC ATROPHY IN PERNICIOUS ANÆMIA

OPTIC atrophy in Addisonian pernicious anæmia is rare; and when it occurs it is usually attributed to ischæmia rather than to an intrinsic degenerative process. Henry Cohen [1] has described two cases in which visual impairment was the presenting symptom. R. K. Kampmeier and E. Jones [2] now give an account of two patients who complained of symptoms referable to the eyes when first seen. A tentative diagnosis of tabes dorsalis was made but subsequent investigations showed that both patients had typical pernicious anæmia. The authors discuss also a third case in which the diagnosis was more doubtful owing to incomplete investigation and failure to obtain a post-mortem. One patient gained definite improvement in vision following adequate liver treatment. In the other vision was unaltered after a short period; but since the nervous system responds much more slowly to therapy than does the hæmopoietic it is possible for improvement to occur after the lapse of years rather than months. The authors believe that the atrophy is more likely to be an intrinsic degenerative process than due to ischæmia, since though severe grades of anæmia with red cell counts below a million are quite often seen in Addisonian anæmia optic atrophy is rare. The fact that their cases had red cell counts between 1 and 2 million rules out, in their view, an ischæmic origin for the atrophy. They emphasise the importance of bearing in mind the possibility of pernicious anæmia when investigating cases of optic atrophy, so that treatment may not be delayed.

INCUBATION PERIOD IN UNDULANT FEVER

IN New York City an ordinance has been in force for the last ten years requiring the pasteurisation of all milk and cream, except certified milk, sold commercially. The opportunity, therefore, of contracting brucella infection in the city itself has been practically confined to users of certified milk, which has formed only about 1–2·5 per cent. of the total supply. Very few indigenous cases of undulant fever have occurred during the years 1928–37 among a population of seven million. In fact only four cases were recorded in which some obvious source of infection, such as certified milk, could not be incriminated. Most of the cases that occurred were in persons who had been infected outside the city, often while staying on a farm during vacation. Advantage has been taken of this fact by Hardy, Frant, and Kroll [3] to ascertain the usual length of the incubation period of undulant fever. Seventeen cases were available for analysis. The time from the date of exposure to the onset of the first symptoms varied from about 2 to 30 weeks. The most usual length of the incubation period was 6 to 7 weeks. These findings are of particular value in lending support to the current belief, founded on numerous individual cases, that the incubation period in undulant fever is very variable and may exceed 6 months in duration. It is probable that all the cases under review were examples of infection with *Br. abortus*. Analysing the seasonal distribution of undulant fever in New York City residents it was found that the majority of the cases occurred in October to December, following, that is, the holiday season. In the United States as a whole, the maximum incidence occurs during the spring and summer months. This difference in distribution, together with the practical absence of indigenous cases of undulant fever, leaves little doubt that the effective pasteurisation of milk and cream results in the virtual abolition of milk-borne brucella infection. Experience in London, it may be noted, where over 90 per cent. of the milk is heat-treated, is very similar to that in New York City. Very few cases of undulant fever have occurred, and practically all of them have been traced to infection outside London, or to the consumption of raw graded milk in the city itself.

[1] *Lancet*, 1936, **2**, 1202. [2] *Amer. J. med. Sci.* 1938, **195**, 633.
[3] Hardy, A. V., Frant, S., and Kroll, M. M., *Publ. Hlth Rep., Wash.* 1938, **53**, 796.

LIMITATION OF OPIUM PRODUCTION

Two years ago both the council and the assembly of the League of Nations urged the importance of limiting the cultivation of the opium poppy. The latter body held that such limitation "constituted a decisive step in the campaign against the abuse of narcotic drugs and a logical and necessary crowning of the efforts of the League." The problem doubtless presents difficulties but there is no justification for further procrastination. Questionnaires have been issued and replied to by producing countries, much documentation has been furnished and considered at private sessions, and preparatory conferences have been held. Statistics show that, except in Yugoslavia, Soviet Russia, Bulgaria, and Japan, the amount of production increased by some 660 tons between 1935 and 1936, and the area under opium poppy cultivation also increased in all producing countries except Korea. The world production of raw opium, excluding the quantities produced in China, Manchukuo, and Afghanistan, was 2300 tons in 1936, whereas the world consumption was said to be only 1120 tons. Thus production was said to be more than twice as great as the legitimate world needs. During the same year the export trade from the producing countries rose from 391 to 463 tons, while the world stocks increased from 2550 tons in 1935 to 3474 tons in 1936. The advisory committee has resolved itself into a preparatory committee to pave the way for the urgently needed international conference for limiting cultivation and production. The secretariat has presented to the committee proposals for establishing in future the world needs of raw opium, for allocating to each producing country the amounts required for internal consumption and for export to non-producing countries, and for securing effectuation of the proposed convention. They again emphasise that the lack of control of traffic in narcotics in the Far East, notably in Manchuria and the occupied provinces of China, constitutes a world-wide peril.

ADMISSION OF AUSTRIAN DOCTORS

ON Monday last Sir Samuel Hoare, the Home Secretary, accompanied by Lord Winterton, met representatives of the British Medical Association, the Royal College of Physicians of London, the Royal College of Surgeons of England, and the Society of Apothecaries of London for a discussion on the admission of Austrian doctors to practise in England. It was agreed that it would be possible to admit only a limited number, and that any such admissions must be the subject of careful selection. Committees representing the medical and dental professions are to be set up to assist in the selection of doctors and dentists seeking admission.

SPECIAL ARTICLES

PLANNING A HOSPITAL *

By Sir Henry Gauvain, M.D., M.Chir. Camb., F.R.C.S. Eng.

MEDICAL SUPERINTENDENT OF THE LORD MAYOR TRELOAR CRIPPLES' HOSPITAL AND COLLEGE, ALTON AND HAYLING ISLAND; AND OF THE MORLAND CLINICS, ALTON

It must occur to every medical man who views a hospital with a critical eye that there are defects, even in the most perfect, which should have been avoided or should be rectified, and which, had he been concerned with the design would never have arisen. It has been my happy lot, or perhaps misfortune, to be entrusted in association with an architect with the design of a large hospital, and I hope to deal with this subject of design from the point of the doctor who thinks he knows what he wants, who explains to the architect what is needed, and who is sympathetically helped, advised, and not infrequently restrained by him.

GENERAL CONSIDERATIONS

The Treloar Hospital was built to replace a wooden structure erected for the treatment of wounded soldiers in the South African War. At the conclusion of that war it was handed over to Sir William Treloar for the treatment of crippled children but we realised that it would have to be replaced sooner or later by a substantially built hospital specially designed for the purpose.

It was early decided to adopt the pavilion system, the ward units being self-contained and adjacent to each other with the exception of the isolation and observation blocks. This facilitates the transport of patients, avoids the use of lifts or stairs, and is much safer for rapid evacuation in the unlikely event of fire.

An important feature in treatment is the utilisation of sunlight and fresh air. Advantage may be taken of the former in one of two ways, either by wheeling the patients from the wards to adjacent balconies or leaving the patients stationary and removing the wards. The old hospital consisted of twenty entirely separate wards each accommodating twenty patients, and the difficulty of conveying the patients into the open air was considerable. Each child had to be wheeled an average of 60 ft. from ward to balcony and the same distance on return sometimes as often as four times daily, so that each child was wheeled daily an average of 480 ft., and the 300 children over 27 miles. An enormous amount of wasteful labour was thus required, involving great strain on the nurses, discomfort to the patients, and considerable damage to the wards and equipment. When there was a sudden shower of rain it was often impossible to return all the children to the ward without some being drenched. This state of affairs had to be remedied in the new hospital.

OPEN-AIR WARDS

I had the advantage of a private clinic at Morland Hall where I was able to experiment undisturbed by committees whose members might express divergent views. There I constructed the first balcony for use in all weathers.[1] It has a sliding roof of Vitaglass (with louvre ventilators), which can be opened or closed at will, and underneath a canvas awning to provide shade. The balcony may be entirely open or entirely closed or in any intermediate position at will, and is always well ventilated. This design proved both convenient and economical, and the Treloar wards have been built on the same principle.

If we pursue the principle of minimising the transport of patients to its logical conclusion it is clear that in the ideal open-air ward the patient should be the fixed object and roof and walls should be removable. This is perfectly feasible and such a ward which I had constructed on the flat roof of an existing building has been in efficient service for more than ten years at King George's Sanatorium for Sailors at Bramshott. Patients occupy this ward day and night all the year round, undoubtedly to the advantage of their health. The danger of infection of all kinds is reduced to a minimum, basal metabolism is raised, appetite rapidly increases, and recovery is hastened; from every point of view it is advantageous to the *suitable* patient. I emphasise the adjective suitable with reason, because a very sick person who cannot respond to the stimulative effect of sunlight and fresh air must conserve his resources and should not be exposed to such strong tonics until adequate powers of response have been acquired. Such wards therefore suit most chronic patients and particularly adolescents and young adults who are approaching convalescence, but are definitely contra-indicated for rapidly deteriorating or dying patients.

THE WARD UNITS

The main hospital, the general lay-out of which I have described elsewhere,[2] consists of five similar ward units of 60 beds each. Experience has shown us that one fully trained sister is able to supervise such a unit with the assistance of probationer nurses. The Board of Education has laid down that 30 such patients may be taught by one teacher, and in order to earn the educational grant for a hospital school most economically the ward unit is divided into two similar parts, each half consisting of one large ward of 24 beds, one small four-bedded ward, and two single-bedded cubicles. Four separate cubicles have proved ample for very ill, very septic, or suspected infectious cases, and two four-bedded wards have been quite adequate for post-operative cases, children requiring care in warmer surroundings, or those who are better nursed apart for æsthetic, disciplinary, or other reasons. The danger of infection is reduced to a minimum by passing all patients on admission through observation wards and treating them in separate cubicles until the quarantine period is over. Child visitors are never allowed, and no one may visit any patient between January and March except those on the danger list who are nursed in separate rooms. All the staff and patients are immunised against diphtheria before or on admission.

In modern hospitals both for children and adults there is a growing tendency to replace large wards by numerous small wards or single- or double-bedded rooms with the idea of reducing the spread of infection. I decided against this method at Alton chiefly because of the urgent necessity for ready supervision by a responsible person in the care of crippled children, many of whom are nursed in splints and extensions requiring frequent adjustment.

Five ward units are erected on the great terrace (Fig. 1). This terrace is 1000 ft. long and 25 ft. wide, and since a great deal of the patient's life is spent there, its design is of great importance. The

* Based on the annual oration delivered before the Medical Society of London, May, 1938.

[1] *Lancet*, 1927, **1**, 755.

[2] *Ibid*, 1933, **1**, 321.

colouring is green, to be restful to the eyes, and the paving is impregnated with carborundum to secure a non-slipping surface. A bitumen surround allows for the expansion of the stone paving blocks in hot weather and a non-climbable balustrade checks the mountaineering exploits of adventurous convalescents.

FIG. 1.—The great terrace.

In the centre of each ward unit is sister's office, where she can command the whole unit. The 48 patients in the two large wards and the patients outside on the terrace (Fig. 2) are under her eye and she can see what is going on in the small wards and cubicles. Moreover, she commands the main entrance, around which is placed the kitchen and stores, the surgery, the mattress and linen room, the nurses' cloakroom, the teachers' room and store, and the ward-maids' department. She is in telephonic communication with every department of the hospital and controls the lighting of her unit.

The whole of the southern expanse of the ward has folding doors which are closed during bed-bathing and when it is very cold in the winter, to avoid useless exposure of the children. Cross ventilation above the doors provides fresh air at all times. The wards are heated by panels in the terrazzo surround, an arrangement which keeps out damp and keeps feet warm and heads cool, and each ward has a pleasantly tiled open fireplace, for the psychological effect of a fire is great on dreary winter days.

The ward walls to a height of 4 ft. are terrazzo with all angles rounded, while the centre flooring is teak. The whole south side of the ward being open, beds may be pushed out with the minimum of labour and, if rain or snow falls while the children are out, the sliding terrace roof of wired vita glass is lowered and instantly affords the desired shelter. The walls on the north side of the wards are protected from damage when the beds are being brought back by steel bars covered with Sorbo and leather which act as buffers to both patients and wall. The sanitary annexes to each ward have been planned with great care, and all bedpans and bottles can be effectively sterilised.

The doors in the wards are of metal, metal lockers are provided for each patient, and a metal drawer is fixed to each patient's bed for his toilet requisites. The beds and stands are metalised to avoid the usual chipping of paint, and are often provided with fracture boards. Most beds have metal lathes, higher at the middle than the sides, under the mattress, so that when the bed is made and the blankets tucked in the mattress does not sag in the middle, an important feature when leg extension has to be employed.

Notes, charts, and radiograms are kept in an easily movable compact trolley which accompanies the surgeons on their rounds. All wards and departments are equipped with wireless which is extensively used for educational purposes and is much enjoyed by the children.

FIG. 2.—View from a ward.

OBSERVATION BLOCK AND ISOLATION HOSPITAL

As already mentioned new admissions are treated in separate cubicles in the two observation wards for a requisite quarantine period before transfer to the general wards. During this period notes are taken and treatment prescribed, the patients are seen by the dentist, and by the ophthalmic and ear, nose and throat surgeons where necessary, splints are made if required, radiograms taken, and the head teacher examines each patient separately and advises the ward most suitable for his or her educational requirements.

The isolation hospital includes one 12-bedded ward, two 4-bedded

wards, separate rooms, and an annexe of five cubicles with glazed partitions and a glazed passage at its back, where patients suffering from different infectious conditions may be kept under separate observation. Each cubicle, which is completely separated from its fellow, has a vita-glass roof which can be raised by gearing, allowing the fullest access of sunlight and fresh air. Balcony accommodation with its possible risks is therefore not needed.

THE TREATMENT CENTRE

The Silver Jubilee Treatment Centre is in a central position in relation to the ward blocks, and has a main entrance from the roadway and entrances for patients connected by sloping ways with the cloisters which run the whole length of the ward blocks on the north side. Beneath the cloisters is the main subway which carries the electric lighting and power cables, low pressure hot water for heating, domestic hot-water supply, low and high pressure steam mains, condense mains, cold water and high pressure fire mains, all being readily accessible. A basement under the whole centre will allow future alterations

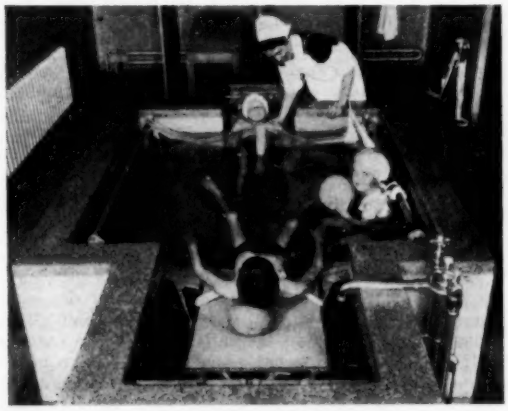


FIG. 3.—The bathing pool.

or additions to drains and waste pipes to be made at little expense.

The central feature of the treatment block is the waiting hall 40 ft. square from which there is direct access to the operating theatre, X ray room and photographic studio, dental surgery, plaster room, massage and remedial exercise room, and dispensary. The design of the waiting hall is simple and dignified. The walls are finished in Biancola with a plastered coffered ceiling, and the floor is of polished teak blocks with a wide terrazzo border with heating panels underneath. In the hall patients needing special treatment are assembled, being conveyed thither from the wards in electric trolleys.

Special attention has been given to the planning of the operating theatre with all its adjuncts. The surgeons' and nurses' changing rooms immediately adjoin the theatre and have observation windows overlooking it. The anæsthetic room forms a lobby between the waiting hall and theatre with surgeons' store opening from it, and there is direct access without doors to the wash-up and sterilising rooms from the theatre.

The walls of the operating theatre and adjoining apartments are finished in pale green Vitrolite, with a painted plaster ceiling and a floor of polished

FIG. 4.—The covered winter playground.

terrazzo tiles. The walls and ceilings are fitted with heating panels and, since the low pressure heating system is not used in the summer months, there are additional panels heated from the low pressure steam mains which are in commission throughout the year. The theatre and anæsthetic room are ventilated by an air-conditioning plant on the roof. This plant has oil filters, washers, heater batteries, a fan which discharges cleaned warmed air through openings high up in the theatre, and an exhaust fan which removes the air from near the floor. The plant keeps the theatre and adjoining rooms well ventilated and prevents anæsthetic odours penetrating to other parts of the building.

Great care has been taken with the electrical arrangements to prevent possibilities of fire or explosion. All plugs are interlocking and the switches are of the enclosed mercury sparkless pattern. An automatic secondary lighting system has been installed. Arrangements are provided whereby radiograms can be placed in a viewing box by the radiographer from outside the theatre, while the intensity of light on the negatives is adjustable from inside. Electric power for instruments is obtainable through plugs attached to two steel columns suspended from the ceiling to within easy reach, so that the drawback of cables or distributor on the floor is avoided.

The sterilising equipment is of the recessed type and comprises dressings steriliser, water steriliser, combined bowl and instrument steriliser, distilling apparatus, blanket warmer, and a sink for rinsing instruments. The plant and the building housing it has been designed as far as possible to eliminate ledges which collect dust. The present operating table was constructed of deal by the hospital carpenter nearly 20 years ago and mounted on wheels from a discarded sofa. It has sufficed for thousands of operations, but is to be replaced by one specially designed for us and worthy of the new theatre.

The patient leaves the theatre by a separate exit and, if the operation has been a major one, is transported to the adjoining recovery ward, comprising six roomy cubicles planned for easy observation, with its own surgery, kitchen, and sanitary annexe. Here the patient may be cared for efficiently without the distractions of an ordinary ward, and without distressing other patients if he is very ill or in need of special attention such as blood transfusion and the like. The recovery cubicles have a folding wall next to the corridor, so that the patient may be taken in easily and promptly even if he has extensions or unweildy apparatus. As soon as the patient is well

enough he is returned to his own general ward, where his education may be continued.

MASSAGE AND REMEDIAL EXERCISE ROOM

The main exercise room measures 36 by 22 ft. and has walnut panelled walls fitted with heating panels. The floor has a teak wood block border with rubber paving in the centre to give a good foothold for the patients taking walking and other exercises. Adjoining the main exercise room are 3 cubicles for massage treatment. The massage department opens on to a lawn where remedial exercises may be undertaken in the open air under favourable weather conditions. Leading from the massage room is a special room 25 by 13 ft. with a bathing pool for remedial exercises. The floor and pool are finished in marble terrazzo and the walls have a biancola dado with painted plaster above.

The pool (Fig. 3) is cruciform, so that attendants can deal with patients without getting into the water themselves. This shape has the further advantage of reducing the amount of water required, a matter of some importance if medicated waters are used. The pool holds about 750 gallons and is filled from the hot and cold mains through specially large taps. For patients with defective circulation, as in anterior poliomyelitis, especially warm water is required, but the rate of cooling is slow, and the occasional addition of hot water is found to be sufficient to counteract it. Patients with limbs so paralysed that movement against the friction of the beds on which they lie is impossible, can move their limbs in the supporting and frictionless water, and remarkable progress and return of muscular power has been recorded. In rheumatoid arthritis and allied conditions, too, the genial warmth of the water is of considerable value. Recumbent children (paraplegias from spinal caries and the like) are strapped on sorbo-padded steel plinths, while children needing arm exercises sit on duralumin sorbo-padded stools.

OTHER TREATMENT ROOMS

The plaster room was specially designed for its work. It has a buff tiled floor and a tiled dado with painted plaster above. It is fitted with the necessary sinks and appliances, including gallows for plaster spinal jackets and casts and special stands for hip and knee plasters and for the casts on which non-inflammable celluloid splints are made. A slate-covered trolley is provided for transporting heavy plaster casts. As celluloid splints are made of celluloid dissolved in acetone, ample ventilation has been provided for. A small adjoining room contains the necessary bins for storing plaster and gratings for keeping plaster beds and casts ventilated.

The dental room has a dental chair and accessories of the latest type with blue lights and a steam steriliser for instruments.

The X ray room, studio, dark room, and fireproof film store are in a suite entered from the waiting hall. The department is entirely shock-proof and all wires within reach of the patient have been eliminated. The conductors feeding the overcouch tube are of shock-proof cable and earthed on the outside, and the tube itself is contained in a shock-proof shield. The apparatus comprises a valve-rectified transformer unit operating from a rotary converter which is placed in a room outside the department itself to exclude noise. The transformer has a very large range of output so that very fast exposures can be made. A special type of radiographic table has been installed fitted with two entirely shock-proof tube-holders. The overcouch tube-holder has a dual focus tube comprising a fine and broad focus, and the table is fitted with a Potter-Bucky diaphragm in which a casette is placed and a very fine system of viewing lanterns has been installed as well as a stereoscope. The department has, in addition, a portable apparatus for special cases in the wards and for use if there is a temporary breakdown of the main plant.

Next to the X ray department is the photographic studio with apparatus for photographing recumbent or ambulant patients by natural or artificial light. This room is also used by the ear, nose and throat and the ophthalmic surgeons and can be readily darkened at will. It also contains apparatus for short-wave therapy.

The dispensary and dispensary store opens into the waiting hall and has a separate exit from the store on to the covered ramp. In addition to the usual fittings it contains a refrigerator for bacteriological purposes.

In a wing on the west side of the block are the research and routine laboratories and the out-patients department with separate entrances. Both wings of the treatment centre are so constructed that additional floors may be added if the development of our work needs them.

There remain the accessory rooms so necessary in such a treatment centre and apt to be overlooked, such as clean and soiled linen room, lavatory accommodation for staff and patients, porters room, ward-maids room, and a store for the chairs needed when the hall is used for lectures.

LIGHT DEPARTMENT

For our special needs, a fully equipped light department is an essential.[3] I did not erect this near the treatment centre, because I felt the centre would be incommoded by the constant stream of patients, some fifty or more a day, receiving light and allied treatments. Owing to the fall in levels the eastern half of the hospital is two-storied, and I have made the central portion of the lower floor a covered winter playground (Fig. 4) provided with radiant heat and ultra-violet light, but quite open on its southern aspect. Next to this is a room for hobbies and rest for ambulant patients, with separate cloak-rooms for boys and girls, a servery, dining-room, and school-rooms for ambulant patients. These latter can be thrown into one long hall for plays or entertainments, and from them opens a teachers' common room and head teacher's room. Behind is the extensive light department with sister's office, examination room and spray, and the splint shop with its fitting room.

This hospital of my dreams is now completed. Doubtless in many ways it could be improved upon but I can truly say I am very content. It supplies at any rate what I consider the most urgent need of a modern hospital—properly designed and protected balcony accommodation. To appreciate that need one must have been a patient as well as a doctor. The advantage of getting into the open air away from the signs, sounds, and smells of the sick room must be experienced to be understood, and in my opinion it is a curative factor the importance of which is as yet insufficiently recognised.

I desire to acknowledge my indebtedness to Mr. H. Smart, F.R.I.B.A., the hospital architect, for his many kindnesses and coöperation.

[3] *Ibid*, 1925, **1**, 871.

MEDICINE AND THE LAW

Artificial Abortion following Rape

ON July 1st at Marylebone police-court Mr. Ivan Snell conducted an inquiry on a charge against Mr. Aleck W. Bourne, honorary obstetrical surgeon to St. Mary's Hospital, which raises a very important question of law. If a girl below the age of consent becomes pregnant as the result of rape, can a surgeon lawfully terminate her pregnancy?

PROSECUTION

Mr. H. A. K. Morgan, who appeared for the Director of Public Prosecutions, explained that Mr. Bourne, who was very highly regarded in his profession, had deliberately and openly defied the law for reasons which he thought good and sufficient. He was charged that he, on June 14th, with intent to procure the miscarriage of a woman, unlawfully used an instrument. The law did not specifically recognise as justifiable any interference with pregnancy. It appeared from the authorities that the procurement of a miscarriage was considered permissible where it was necessary to save the life of the mother or of the child. Apparently it was not permissible on any other ground whatever, such as for the sake of family honour or for ethical reasons. Mr. Bourne was one of a number of medical men and others who held the view that the present state of the law on abortion should be altered or relaxed. In order to ventilate this opinion he had, counsel submitted, committed a crime for which the maximum penalty was penal servitude for life. He had been exceptionally fortunate in finding what from his point of view was an absolutely perfect case for his purpose. The girl was under fifteen years of age and had become pregnant through no fault of her own. The case would quite naturally enlist a great deal of sympathy—much more sympathy, of course, than if she had been a loose woman pregnant through her own carelessness, or a married woman who did not wish to have a child.

The facts were simple and undisputed. On April 27th the girl had been criminally assaulted and raped on the Horse Guards Parade. On May 21st, having missed one of her periods, she was taken to see Dr. Joan Malleson, a fellow-member with Mr. Bourne of the medico-legal council of the Abortion Law Reform Association. Dr. Malleson wrote to Mr. Bourne—to whom she had sent gynæcological cases before—and he replied that he was interested in the case and would be delighted to admit the girl to St. Mary's and curette her; that he had done this before and had not the slightest hesitation in doing it again; and that he had said that next time he had such an opportunity he would write to the Attorney-General and invite him to take action. The girl's mother had accordingly taken her to see Mr. Bourne; a letter of consent to the operation had been obtained from the girl's father, and on June 6th she was admitted to the hospital; after a test for pregnancy had proved positive and tests for venereal disease negative, Mr. Bourne had emptied the uterus on June 14th. On that day Chief-Inspector Walter Bridger—not as a direct result of any communication from Mr. Bourne—had called to see him at the hospital. Mr. Bourne had then said, "I emptied the uterus this morning; I want you to arrest me." The Chief Inspector had said he would report the facts to the proper authorities. Mr. Bourne had then said that in his opinion as an obstetric surgeon it might be dangerous for a girl of her age to bear a full-term child. Up to now, remarked Mr. Morgan, that was the only defence which had been put forward, and he did not think it was meant for a real and serious defence as the law now stood. If it were a good defence, anyone who wished to procure abortion for reasons of gain or sympathy could say that in his opinion it might be dangerous for the woman to bear a child, for childbirth was dangerous to any woman. The law of abortion would then be a dead letter.

The girl who had been the subject of the operation gave evidence of the facts. Her father said in evidence that he had given his consent subject to a promise of secrecy because the girl was just starting in life and publicity would have caused her to lose her job. Dr. Joan Malleson testified to correspondence with Mr. Bourne in which he had spoken of an urgent request by the parents not to draw attention to the case by making it a cause célèbre, and had asked her to persuade the father to revise his decision on this matter. In cross-examination, she said that the girl had been brought to her by a lady organiser of a school care committee. Dr. P. C. F. Wingate said that he had been resident obstetric officer at St. Mary's Hospital at the material time, had taken charge of the girl, and been present at the operation, which had been carried out under proper surgical conditions. The girl had been competently attended before, at, and after the operation.

DEFENCE

Mr. Gerald A. Thesiger, counsel, who appeared for Mr. Bourne on the instructions of Messrs. Le Brasseur and Oakley, solicitors to the London and Counties Medical Protection Society, submitted that the facts did not disclose a felony. He rather regretted, he said, the abolition of the grand jury. Sir Arthur Denman had recorded that on at least two occasions on the South-Eastern Circuit a grand jury had exercised its discretion, in cases of a somewhat different nature, not to present a bill for trial. The rape of the girl had been a felony, and she had been below the age of consent. With the consent of herself and of her parents, in conditions as safe as could be imagined and by a man of the highest qualifications, the result of the felony had been removed. The law of England was not so crazy or so cruel as to lead to the position that the surgeon had committed a felony and the parents of the girl, Dr. Malleson, and Dr. Wingate had abetted it.

The summons served on Mr. Bourne alleged a breach of the Offences Against the Person Act, 1861, s. 58. This section provided that it was a felony, punishable with penal servitude for life, for a woman with child to administer "unlawfully" to herself a poison or any other noxious thing, or "unlawfully" to use any instrument or other means with intent to procure her own miscarriage; the same penalty was provided for anyone who did these things "unlawfully" with the intent to procure the miscarriage of a woman, whether she was pregnant or not. The word "unlawfully" occurred four times in this section, and Parliament had clearly intended that in certain circumstances the use of an instrument for the purpose set out should not be unlawful. Parliament, possibly with great sense, had left to the generations that came after 1861 to define from time to time what should be lawful.

The age of the girl was an important fact. For many years before 1926 sexual intercourse with a child under 16 had been prima facie a criminal offence unless she were married, when her husband might lawfully have intercourse with her. In that year the lowest age for marriage had been raised to 16,

and Parliament had therefore taken great precautions to see that a child under 16 should not be put in the family way even in marriage, whether she consented or not. The girl in the present case had become pregnant through a trespass upon her person and through the felony of rape. It could not be said to be unlawful to avert the consequences of a felonious trespass on a child below the age of consent and below the age at which she could be married. A reasonable construction of the section was that in the circumstances Mr. Bourne's act had been perfectly lawful. Counsel invited the magistrate, unless he considered that the matter required further legal investigation with a view to establishing the position finally, to hold that an offence had not been disclosed and to dismiss the case. Mr. Bourne, he added, would have communicated with the authorities if he had not been bound by the condition imposed by the father. He had acted openly and had been anxious to let the authorities know what he had done.

COMMITTED FOR TRIAL

Mr. Snell pointed out that he was not in the position of a grand jury, but was merely investigating the case to see whether there was sufficient evidence to send it for trial before a jury. He was not competent, and it would be grossly improper for him, to express an opinion on the law. The matter was most important, as everybody would recognise, and that it should go before a jury and a judge of the High Court was probably the wish of Mr. Bourne and his advisers. The Act used the word "unlawfully" several times, and a jury would, as directed by the judge, examine the facts and circumstances and no doubt say whether the act was unlawful. That the evidence showed a prima-facie case there could be no doubt whatever, and he was not competent to say whether it showed that the act was unlawful. He therefore committed Mr. Bourne for trial at the Central Criminal Court and allowed him bail in his own recognisances. Mr. Bourne made a formal plea of not guilty.

Escape of a Diphtheria Carrier

Is there any legal authority for detaining in hospital a carrier of infection? Donald Rowlands, a 12-year-old boy who is a carrier of diphtheria, was placed in a Manchester isolation hospital. Having been absent from his parents for nearly two months, he escaped last week and, in spite of police cordons designed to intercept him, found his way home to Wallasey, 40 miles away. He had travelled by train; on arrival he talked to various friends. The resources of the B.B.C. were enlisted to warn all possible contacts that they should get into touch with their doctors. Having left a note for his mother with the laconic message "Donald home," he was presently taken off again in an ambulance to the Mill-lane Hospital in Liverpool. Headlines in the newspapers suggested the lurid prospect that Donald might infect the whole country. The medical officer for Wallasey issued the reassuring statement that there was no reason to anticipate an epidemic; the chief risk would attach to persons who sat next the boy in omnibus or railway carriage if they were in close contact or if there was breath inhalation.

It is not easy to be dogmatic about the legal right to restrain the movements of a diphtheria carrier. Infected persons are forbidden by law to go into public conveyances or in other ways to conduct themselves in such a manner that they spread infection. The infectious patient may be removed to hospital on a magistrate's order where there is serious risk of spreading infection; he may also be detained in hospital where he has no proper lodging to return to. Where the patient is a child of school-going age, he may, if suffering from a notifiable disease, be ordered not to attend school. But do these provisions of the Public Health Act apply to carriers as well as to patients actually suffering from infectious disease? The section restricting school attendance, to which reference has just been made, is accompanied by a marginal note which speaks of "Child liable to convey notifiable disease." These words in the marginal note suggest that the section applies to carriers as well as to actual sufferers; but the section itself does not specifically support this view. It seems, in fact, that there is no legal power to keep a carrier in hospital. Donald Rowlands perhaps can be forbidden under the Public Health Act to go to school. And then perhaps his parents can be summoned under the Education Act for not sending him to school. And in the result it is conceivably possible that the magistrates would excuse the parental neglect of the child's education if the parents undertook that he should remain in hospital. If this be the true position, it is a complicated one. Parliament does not lightly allow the citizen, young or old, to be deprived of personal liberty. It was regarded as an "entirely new principle"—to use the words of the Select Committee on Local Legislation—when Section 56 of the Bradford Act of 1925 allowed the compulsory removal of the aged and infirm to a hospital or other suitable place. The medical officer had first to certify that somebody was either "aged, infirm or physically incapacitated" or else "suffering from a grave chronic disease"; if in either case the person was unable to look after himself or was not being properly looked after, his removal could be ordered when "thorough inquiry and consideration have shown the necessity in the public interest and in the interests of the health of such person or any person with whom he resides." The clause (which has since been copied elsewhere) shows the anxiety of the legislature not to use compulsion except in the last resort. A hospital, needless to say, is not well equipped for the strict confinement of its patients and for preventing their escape. The infectious patient, like the temporary or voluntary patient in a mental hospital, can find his way out with a little ingenuity and determination. It may be that all the penalties of the law against assault will attach to the person who tries to prevent the escape.

MATERNITY AND CHILD WELFARE

NATIONAL CONFERENCE

THIS conference was held at Bristol from July 5th to 7th, under the presidency of Mr. R. H. BERNAYS, M.P., parliamentary secretary to the Ministry of Health.

Psychology of Pregnancy

Prof. H. J. DREW SMYTHE, M.D. (professor of obstetrics, University of Bristol), said that the great majority of women looked forward to marriage, home, and the bearing of children. After marriage reality had to be faced, and in many cases the economic situation was the criterion as to whether a wife was to become a mother. Dr. Smythe deprecated the publicity given to the dangers and hardships of childbirth, which was resulting in widespread fear of childbearing. More than 99 per cent. of cases were normal, and our maternal mortality-rate was lower than that of any country in the world except Holland.

Our women should be encouraged by these facts, not frightened by dwelling on the few bad cases until they regarded motherhood as being as perilous as the Great Plague. The pregnant woman was apt to be emotional and easily upset, and it was possible that constant supervision might engender the thought of disease or complications. The doctor should be careful at the patient's first antenatal visit to explain why supervision was necessary and to try to dispel anxiety from her mind.

Postural Defects in Young Children

Mr. R. C. ELMSLIE, F.R.C.S. (consultant surgeon, Royal National Orthopædic Hospital), said that posture must be appropriate to the action of the moment, and a defective posture was one not necessitated by or adapted to the action. A child began to hold up his head and then to sit up not, as was commonly believed, when he had developed sufficient strength, but when he had developed sufficient postural tonus to enable him to control his position without mental effort. An habitual posture became a defective one when it interfered with normal function or when it might lead to the development of a fixed deformity. For example, an habitual stoop interfered with full expansion of the chest, and an habitual lateral curve of the spine might lead to a fixed scoliosis. Prevention of habitual defective postures could be achieved by allowing and encouraging freedom of movement and by using methods of exercise that would improve control of movement and balance. Nutrition must be normal, defects of vision must be attended to, and some adjustment of shoes might be required to correct a valgus deformity.

Mr. JOHN BASTOW, F.R.C.S. (surgeon, Bath and Wessex Orthopædic Hospital), dealt with orthopædic defects likely to be encountered immediately after birth, when the child began to sit and stand, and at the time of school entrance. In the third of these periods the commonest postural defects were poking chin, round shoulders, projecting shoulder-blades, flat chest, round or hollow back, protruding abdomen, knock-knees, and flat-feet. Such defects were usually associated with over-fatigue and under-nourishment, and these factors must be eliminated if treatment was to succeed. Next to adequate rest, remedial exercises were most valuable. They should at first be performed with the child lying down, and be especially designed to ensure correct breathing and strengthening of the trunk muscles.

School and Child Welfare Medical Services

Dr. A. S. M. MACGREGOR (M.O.H., Glasgow) and Dr. R. H. PARRY (M.O.H., Bristol) favoured the closest possible coöperation between these services. In most parts of Scotland, Dr. Macgregor said, the two services had been amalgamated. They came into close relationship at three main points: (*a*) the joint use of remedial clinics; (*b*) the medical inspection of the pre-school child; (*c*) the nursery school. Up to now two large joint centres had been erected. In these the maternity and child welfare department had its antenatal and child welfare suites, the latter including weighing- and consulting-rooms, a demonstration room, and a large hall with kitchen for social and educational activities. The section for school-children had treatment rooms, facilities for orthopædic treatment, spray baths, and ultra-violet ray equipment. The dental suite was common to all attending the centre and was largely used by expectant mothers. Dr. Macgregor thought it immaterial whether medical inspection of toddlers was undertaken by the medical staff of the school or of the child welfare centre. Nursery schools were a function of the education authorities, but their health administration should be undertaken by those who knew most about young children. The health supervision of a new nursery school now being erected in Glasgow had been entrusted to the child welfare department.

Dr. Parry said we should visualise one service to care for the expectant mother, the baby, the school-child, and the young adult. In Bristol there was a joint committee with representatives from the education, health, and public assistance committees, and considerable progress had been made in coördinating the work. Several health centres had been erected by the health committee, all being administered as units, and the whole of the consulting services being available to every branch. Medical and nursing supervision of children in nursery schools and classes was undertaken by the maternity and child welfare staff, thus enabling the same doctor who had attended the baby at the health centre to see him later in the nursery school or class. Another useful result of coöperation was the introduction of a joint scheme whereby girls leaving school at the age of 14 to 16 could work in day nurseries and nursery schools and classes, as well as in health centres and the kitchens of hospitals, being in this way kept occupied and supported until they were old enough to be trained as hospital nurses.

Convalescence of Pre-school Children

Dr. W. J. PEARSON (physician in charge, children's department, University College Hospital) urged the importance of providing better facilities for convalescence for pre-school children. Convalescence was needed not only after illness in hospital but also to prevent the development of serious complaints. Medical study of the pre-school child in hospitals and welfare centres showed how many minor ailments were due to unsuitable home conditions, and it was a revelation to see how quickly children suffering from malnutrition, anæmia, and debility responded to good food, peaceful surroundings, and nursing attention. The importance of convalescence after broncho-pneumonia, whooping-cough, and measles could hardly be sufficiently emphasised, and young children subject to asthma needed to be sent to chosen climates where proper supervision and medical attention were available.

Dr. R. COVE-SMITH (assistant school medical officer to the L.C.C.) spoke of the difficulty in providing care for infants and toddlers in cases of parental illness or domestic crisis. Nursery homes where children could have board-residence under the supervision of a trained staff were urgently needed. Shelters being arranged for the evacuation of children from London and other big centres in case of air raids might be put to useful peace-time service as holiday homes for children whose own homes were temporarily in a state of emergency.

Retrospect and Prospect

Dr. G. F. MCCLEARY (chairman, National Council for Maternity and Child Welfare) said that present child welfare activities showed the same characteristics as the pioneer advances. In many cases they were still the result not of central but of local initiative, made possible by the large measure of autonomy exercised by local government authorities. Some of the services, notably the child welfare centres, had grown so popular as to be overcrowded; more accommodation and staff were necessary to prevent deterioration in the quality of the work. Other

requirements were an improved maternity service, more specialised provision for prevention of neonatal mortality, and an increase in the number of nursery schools.

Dr. MAITLAND RADFORD (M.O.H., St. Pancras) said that "what is the matter with the poor is poverty." Future development was likely to concentrate upon such aspects of the problem as inadequacy of wages in respect of nutrition, housing accommodation and a reasonably full life, bonuses for babies, family allowances, and differential rents.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENTS)

INSURANCE SCHEME IN NEW ZEALAND

THE New Zealand Government has introduced proposals for the establishment of a universal health service, for the payment of national superannuation commencing at the age of 60 years and for granting increases in State pensions. The health scheme proposed is a "universal practitioner service free to all members of the community who need medical attention." In addition there will be available hospital and sanatorium treatment, mental hospital care and treatment, medicine, and maternity benefits in cash payments, including the cost of maintenance in a maternity home. Further services to be introduced as soon as practicable are anæsthetic, laboratory and radiology, specialist and consultant, massage and physiotherapy, transport to and from hospitals, and dental and optical benefits. The scheme will be operated on the panel system and a patient's choice of a doctor limited only by distance. The practitioner's panel will be limited to a specific number. The Government proposes also to establish a sickness benefit, but the rates and conditions have yet to be determined. Provision has also been made for those who receive neither sickness benefits nor invalid pensions, but whom illness or injury has rendered incapable of earning a complete livelihood. The proposals of the national health insurance scheme differ considerably from the suggestions offered by the New Zealand branch of the British Medical Association at the request of the Government.

The proposal of a free general practitioner service provides the one item of medical service to which the people now have the most ready access; and it omits the very things—particularly the laboratory and specialist services—which are more difficult to obtain. The British Medical Association holds that a considerable proportion of the population is able, and would prefer to provide a complete service themselves, while others suffering from the more serious illnesses are at a disadvantage through lack of specialist facilities. The increased pensions and the institution of the proposed health service are likely to cost in the aggregate over £16,000,000 annually. The revenue from the wages tax, which is to be raised from 8*d.* to 1*s.* in the pound, is expected to be approximately £6,000,000, leaving £10,000,000 to be found by the Government. In order to provide pensions and health benefits, all able-bodied people will be taxed at the rate of 2*s.* in the pound (1*s.* by direct taxation and 1*s.* by general taxation); in other words, one-tenth of earnings is paid for social security.

HYDATID DISEASE

The incidence of hydatid disease is greater in Australia and New Zealand than in any other English-speaking country, although Argentine and Uruquay, important competitors with us in pastoral pursuits, are much more heavily infected. The spread of the disease both in man and in stock animals is favoured by the conditions attendant upon the large pastoral interests in each country—the large number of sheep, cattle, and dogs, and their close relationship with human beings. Medical, veterinary, and biological scientists in Australia and New Zealand are doing much useful work in connexion with the campaign of prevention, and in carrying out promising lines of research. Two years ago the nucleus of a department for hydatid disease research and prevention was instituted at the New Zealand medical school under the direction of Dr. C. E. Hercus, professor of public health, Dr. E. F. D'Ath, professor of pathology, and Sir Louis Barnett, emeritus professor of surgery. The human incidence of the disease has increased in New Zealand during the past ten years. At the present time a reasonable estimate is that from 100 to 150 cases out of a population of 1,500,000 occur every year, and the case-mortality rate is about 15 per cent. In Australia the populations of New South Wales, Victoria, South Australia, and Tasmania are infected in slightly worse degrees than New Zealand as a whole, but even Victoria, which provides the largest proportion of Australian cases, appears to be less heavily infected than the Canterbury district of the South Island of New Zealand. Queensland and Western Australia both show a very low rate of infection, comparable to that in Great Britain. For several years New Zealand has been carrying on a vigorous campaign for the prevention of hydatid disease. So far the campaign has been limited to the distribution of posters and accompanying explanatory folders, particularly amongst the farming community, schools, abattoirs, and freezing works. In view of clear evidence that much of this laborious and expensive effort is wasted, although undoubtedly a good deal of useful information is assimilated as a result of studying such posters and folders, it is now advocated that at least two legal compulsory measures be introduced and rigidly enforced—the prohibition of the feeding of dogs with unsterilised offal, and the insistence on regular administration of arecoline hydrobromide to all country dogs. The full coöperation of farmers and others in the industry would probably be effective in bringing about the eradication of the disease.

NURSES IN NEW ZEALAND

The hospital authorities have lagged sadly behind in the introduction of those measures which are now integral parts of industrial administration—measures designed towards avoidance of fatigue, the provision of shorter working hours, improved hygienic conditions, and so forth. Salaries of resident hospital nurses are very small, and living quarters in a number of hospitals are inadequate. Leisure time is often interrupted by compulsory lectures, and insufficient notice of off-duty periods is given. Treatment for sick nurses is badly organised; there may be a rule that nurses requiring medical attention must consult a member of the staff, though he may fail to inspire their confidence. As a means of improving the present conditions the extension of the principle of having non-resident nursing staffs is being considered.

GORDON CRAIG MEMORIAL LIBRARY SERVICE

By means of an endowment provided by the late Dr. Gordon Craig, which will be available this year, the council of the Royal Australasian College of Surgeons hopes to build up the best reference library of surgical literature in the southern hemisphere.

A foundation fellow of the College, the late Gordon Craig was anxious that one of its main functions should be the teaching of surgery in its highest forms. Fellows will be able to borrow books and journals and to obtain references to current literature from the librarian. The library already attached to the College building in Melbourne will form the basis of the Memorial Library.

NORWAY

(FROM AN OCCASIONAL CORRESPONDENT)

AMATEUR PSYCHO-ANALYSIS

Ragnar Vogt, professor of psychiatry at the University of Oslo, has protested in sober and measured terms against psycho-analysis as it has developed among laymen in Oslo. His general criticism of psycho-analysis was directed to the lack of any controlled series of cases demonstrating its advantages over some other psychotherapeutic measure. Those who perceive the special difficulties of planning such an experiment will feel that he was on surer ground in his condemnation of the common tendency for the recipient of psycho-analytic treatment one year to become the dispenser of it the next. And so an interminable chain of lay psycho-analysts has been forged with, perhaps, a medical psycho-analyst as the forger of the first link. The methods said to be adopted by amateur psycho-analysts in this country, for example in attempts to overcome the sense of guilt associated with masturbation, are certainly not such as would support the agitation in favour of granting diplomas or certificates to lay psycho-analysts on the same principle as governs the examination and licensing of masseurs. Prof. Vogt would like to see paragraph 364 of the Norwegian penal code extended to apply to the lay psycho-analyst. According to this paragraph, liability to punishment is incurred by the layman who induces faintness, unconsciousness, hypnosis, or similar condition in any person even if his consent thereto is obtained. He is sceptical of any scheme that would entail medical sponsorship of the activities of a lay psycho-analyst, since the intimate relation established between the psycho-analyst and his patient would brook no interference from a third party.

HODGKIN'S DISEASE IN NORWAY

A comprehensive study of Hodgkin's disease has been made by Prof. Francis Harbitz. He has published an account of necropsies on some 50 cases, conducted under his auspices at the pathological-anatomical institute of the Rikshospital in Oslo, and of reports on material, mainly lymphatic glands, from more than 200 cases. Prof. Harbitz has found the disease equally distributed throughout Norway in town and country, with no substantial sex or age distinction, though there is some increase in its frequency late in life. The duration in this series was mostly between two and three years (in three cases four, six, and twelve years), but the disease may also run a rapidly fatal course (three to four months). Treatment by X ray may delay the fatal issue. That the disease may occur in mild or abortive forms which escape recognition and end in spontaneous recovery is possible but not proven.

NICOTINE CONTENT OF TURKISH CIGARETTES

An analysis of eight of the best known brands of Turkish cigarettes sold in Oslo has been undertaken by Prof. Klaus Hansen and his assistant, Dr. Erling Kvalheim. The cigarettes were bought in the open market, stripped of their paper, and the tobacco was well mixed, some being set aside for a water analysis, and the rest for a nicotine analysis by the picrate method. The water content of the tobacco varied from 6·9 to 10·1 per cent., with wide fluctuations in different packets of the same brand in this and in the nicotine content, which varied from 8·7 to 13·2 mg. per cigarette. There were only two brands of cigarettes whose average nicotine content was under 1 per cent. The brand with the highest percentage of nicotine (1·2 per cent.) was one advertised as being nicotine-weak. Another brand, which some years earlier had been found to contain only 0·5 per cent. of nicotine and was then justifiably advertised as nicotine-weak, was now no better in this respect than its fellows. Prof. Hansen is not so much concerned with the merits or demerits of nicotine-weak tobacco in themselves as with the laxity of the present regulations governing the advertisement and sale of tobacco alleged to be free from nicotine.

STUDIES IN MENSTRUATION

Between September, 1932, and March, 1936, a comprehensive survey of probationer nurses attached to nine of the hospitals in Oslo was made by Dr. Jon Björnsson. Among 321 nurses, of ages ranging from 20 to 34, examined in various ways, 180 faithfully filled in certain forms over a considerable period. The data collected concerned (1) their morbidity, (2) their weights, and (3) their menstrual cycles, calculated from the first day of one period to the first day of the next. The morbidity from "colds" and their complications was higher than that of women of the same age in other occupations, but not that from excessive strain or overwork. There was mostly a gain of weight during the first eight months of nursing. Records of 4900 menstruations showed that only in about 6 per cent. of the nurses—i.e., in 11 cases—was the menstruation so regular that the difference between the longest and shortest menstrual interval in the same nurse was five days or less. In 104 nurses this difference was more than ten days. A regular text-book menstrual interval was thus rare, even among nurses with a record of excellent health. Dr. Björnsson has come to the conclusion, perhaps a rash one on such a small series of workers in only one profession, that perfectly regular menstruation is a myth, originating in the inaccuracy of loosely compiled records.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE CIRCULATION AND NEOVITALISM

Prof. Ludwig Aschoff of Freiburg, at present on holiday in Scotland, delivered the Finlayson memorial lecture in the hall of the Royal Faculty of Physicians and Surgeons in Glasgow last week on "The History of the Circulation." Prof. Aschoff said that much work had recently been done on the Hippocratic writings especially by Richard Kapferer and Georg Stocker in an attempt to show that true knowledge of the circulation existed in ancient times. These authors felt that the early advances in medicine before the time of Harvey must have been impossible in the absence of such knowledge, but Prof. Aschoff agreed with Diepgen that there was no evidence from the "Book of the Heart" that the Hippocratic school had discovered the true mechanism of the circulation. It was evident that they regarded the heart as a suction pump and ventricular diastole as

the most important phase, the action of the auricles being to propel the blood along the veins, and the two sides of the heart communicating with each other by pores. This view was held in the early Christian era, but in the thirteenth century an Arabian physician recognised and described the mechanism of the pulmonary circulation and the aeration of the blood. There was no doubt according to the lecturer that William Harvey was the first fully to realise the nature of the general circulation and the fundamental importance of ventricular systole. Harvey however did not observe the capillaries and it was only with the discovery of these structures by Malpighi 33 years later that the fundamental understanding of the circulation was complete. As the result of Harvey's great work the physics of Galileo became more important in medicine than the alchemy of Paracelsus. The materialistic conception of body function grew until it reached its height with the work of Virchow and others on cellular structure and pathology. At the beginning of the twentieth century neovitalism appeared. Under the stimulus of Darwin's work men became interested once again in the nature of life and "vital force," in the electromagnetic properties of cells, and in the physical chemistry of colloid molecules. The problem of life involved the mind and included therefore the wider aspects of metaphysics and religion. The recent staggering advances in biological medicine tended again to stress the physical aspects, but Prof. Aschoff reminded his audience that medicine and especially treatment is and always will be an art as well as a science. There must be an appeal to the mind as well as attention to the body.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

MINIMUM FEES

THE newly constituted Medical Chamber has decided to lay down minimum fees for all types of medical service. Exceptions may be made, as with well-to-do patients from whom up to five times the minimum may be claimed. The object of establishing a minimum fee was to supply a guide in law-suits. The regulations compiled by the chamber state that for consultations outside the usual office hours higher fees may be charged. Night calls are classed among emergency calls and command higher fees accordingly. From April 1st to Sept. 30th, "night" is 10 P.M. to 7 A.M., and from Oct. 1st to March 31st it is 9 P.M. to 8 A.M. All out-of-pocket expenses are to be paid by the patients. Calls at a patient's home may be made at any time determined by the practitioner, by practitioner and patient, or by the patient alone, and if the choice is made to suit the patient's convenience a higher fee has to be paid. If a doctor has to go a kilometre to see his patient his cab-fare must be paid by the patient, and this applies also to all emergency calls. Visits lasting longer than one hour are subject to extra fees. For a consultation, the fee is the same as for urgent calls, and the family doctor who takes part in a consultation must be paid separately, his fee being not less than twice the fee of a first visit, and half as much again if the consultation is at night. For medical visits during which operations or dressings are performed no separate fee is charged unless the time spent or the distance travelled justifies it. No patient may be charged for more than two visits a day unless the doctor has been specially asked to attend oftener or unless the nature of the patient's illness demands more frequent attention. If a practitioner sees more than one member of a household, the patient who called him pays the fee for the visit, while the others pay only a consultation fee. The fees are classified in ten groups:

1	5 pengös.	6	80–120 pengös.
2	5–10 "	7	120–160 "
3	10–20 "	8	160–200 "
4	20–40 "	9	200–300 "
5	40–80 "	10	300–400 "

(One pengö is worth about 10*d*.)

A simple consultation in the doctor's office during his regular surgery hours comes under the second group; urgent calls are in the third group; injections, short anæsthetics, vaccination, and similar services are in the fourth group; blood-letting, gastric lavage, lumbar and sternal punctures, and pneumothorax operations all belong to the fifth. The higher groups cover major surgical operations.

The regulations also establish that steps in any operation such as the ligature of vessels or the suturing of a wound cannot be charged as separate operations. If a surgeon has to perform an operation which is unconnected with the one he set out to do, but becomes necessary during his manipulations, he is entitled to half the fee normally charged for this operation. The granting of certificates during an illness is free, provided they do not require further medical examination.

VITAMIN C FOR STOMATITIS

According to Dr. Fritz the local treatment of ulcerative stomatitis in children is often unnecessary if adequate vitamin C, in a quickly absorbable form, is given. He uses a preparation containing 0·15 g. pure vitamin C in each ampoule, and one injection is given intramuscularly every day. After two or three injections there is much improvement: bleeding ceases, the ulcers heal, and feeding is again painless. Supplementary vitamin C may be given orally but tenderness in the mouth may prevent treatment by this route. Dr. Fritz recommends the injection method because it is simple and painless and shortens the illness.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 25TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1765; diphtheria, 989; enteric fever, 20 (31 "expected"); pneumonia (primary or influenzal), 758; puerperal pyrexia, 188; cerebro-spinal fever, 23; acute poliomyelitis, 4; encephalitis lethargica, 5; dysentery, 39; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 1st was 3437, which included: Scarlet fever, 682; diphtheria, 918 (carriers 44); measles, 724; whooping-cough, 252; puerperal fever, 14 mothers (plus 8 babies); encephalitis lethargica, 280; poliomyelitis, 1. At St. Margaret's Hospital there were 23 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 10 (1) from measles, 3 (1) from scarlet fever, 18 (2) from whooping-cough, 22 (4) from diphtheria, 32 (9) from diarrhœa and enteritis under two years, and 20 (2) from influenza. The figures in parentheses are those for London itself.

Birmingham and Manchester each reported 4 deaths from diarrhœa and enteritis under two years, and Leeds reported 3. There were also 3 fatal cases of whooping-cough at Birmingham.

The number of stillbirths notified during the week was 276 (corresponding to a rate of 36 per 1000 total births), including 42 in London.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM AN AURAL SURGEON

II

"You're a fuss-pot, Mr. Jones. Everybody has been saying you're a fuss-pot ever since you came on as house surgeon. You can't have a clean towel. If you want a clean towel you must go to Matron for it." The sister was tall and handsome, with the dark curly hair that some Irish women have, a mature woman of some seniority in her profession. "Very well then, Sister, I will go to Matron!" and I turned on my heel and walked down the ward my heart thumping against my ribs. The matron was very small and very stately. There was no reason why I should be afraid of her; but I suppose every young house officer stands somewhat in awe of the matron of the hospital.

It had been the first time that Smithers had ever asked for a clean towel in the middle of an operation (not that his name is Smithers any more than mine is Jones). He had just removed a number of stones from a gall-bladder, and, preparing to sew that organ up, wanted a clean towel "so that our strings do not get fouled" as he said in his small still voice. "A clean towel please, Sister," said I. Sister responded, not with a towel, but with a scowl. I went over to the corner of the theatre and asked her for one; she said she had none. I went out through the open door into the preparation room and asked the theatre sister to go to a neighbouring ward and borrow some. The theatre sister was very young; and the ward sister—they "took" the operations in those days—bounced out of the theatre into the preparation room and said "Sister! you'll not go for that bag, I forbid you to go" and back she came flaming. Then Smithers, who had been toying with the gall-bladder, ostensibly making sure he had not left a stone behind, slightly raised his voice, and said "Let's see, Jones, where is that clean towel you promised me?" The sister bounced out again and in a short time came back with a bag of towels from the neighbouring ward.

We had been struggling one with another for four months. I knew it was now or never, and, when Smithers had gone, went up to the ward. There she was at the far end doing a bit of ward washing in the sink. I went along and stood beside her and stammered out "Sister! I want you t-t-to understand that you m-m-may disagree with me w-w-when we are in the ward; but that in the theatre I must have what I ask." It was then that she called me a fuss-pot. The word hissed through her teeth and her brogue returned in her emotion. The matron had the measles—how thankful I was for that disease—and I stated my case to the assistant matron while having tea with her in her sitting-room—a better place than an office for such a conservation. How trivial it all sounds and how my students laugh at me when I tell the tale; the nurses too, for to-day I work in what then was Smithers' theatre. Yet what small thing to-day may we be omitting that will seem as foolish in another thirty years' time?

* * *

It was Smithers' last struggle for a dry aseptic technique. Gloves he had introduced just before, caps and masks when I had first come on—dressers from other firms used to come and laugh at the Smithers firm dolled up in fancy-dress—dry gowns a year or so before, dry dressings at the same time. It was but three and a half years since I had entered the wards; yet in that time every detail was different from what I had then learnt, and Smithers had had to fight for every detail. It had been going on in all for fifteen years; but this tussle of the clean towel in the middle of an operation was the end of it, and trivial as it seems, how much has come out of it. To-day we scatter sterile towels all over the patient, if one touches an unsterile object it is thrown into the corner of the theatre; anyone would be lacking in technique if he did not at times ask for a clean towel. Perhaps we are extravagant; but extravagance is safety where invisible organisms are concerned. And this trivial change has made necessary a complete reorganisation of parts of the hospital. We use more small towels per operation. The old bags would not hold them; they have gone. Their place has been taken by drums. These are more bulky and the sterilisers have had to be enlarged. There is no room for these in the theatre preparation rooms, and this has created a demand for more space; so sterilisation has been detached to a different part of the hospital. The stock of towels has had to be increased out of all knowledge, and thus the supply has been transferred from the individual wards to the theatres, and so new storage room has had to be found therein for them. And it all arises out of Smithers asking thirty years ago for a clean towel, "so that our strings do not get fouled."

* * *

From the days of Lister into our own every change in surgical technique has been small; and now we have a feeling of finality, which is a false one. Change must go on. There can be no stabilisation of technique. A surgeon appears to perform two successive operations for the same lesion identically; yet they are not quite the same, and the slight differences diverge and become larger till they warrant a deliberate change, to be tried and thrust aside or to be absorbed into the canon of his work. In this way a surgeon has, at the end of two years, a technique that is the same and yet appreciably different. It is only thus that he can advance. The safety of his patients demands that he should not revolutionise his work on one occasion. Little by little we must be moving in a direction that we do not know.

* * *

At the present time the change is towards local anæsthesia. We have only begun to realise the implications of this change. The first is kindness to the tissues. The great surgeons have always had it, unconsciously perhaps. Others have taught it to themselves. Yet others have never had it, or even appreciated its existence, and yet have managed to do under general anæsthesia work that was reasonably good. This type of surgeon must disappear when local anæsthesia is the rule of the day. You cannot be unkind to the tissues under a local; the patient will not let you. And the next is kindness to the patient. With the development of operative technique we have forgotten theatre technique, or

perhaps have never developed it. The war set it back. Lines and lines of huddled figures passed through the operating rooms and on to the base. The young surgeon never knew his patient and his patient knew not him. The personal touch between the patient and the surgeon was gone, and he came back to "do his list" on his "afternoon." The students and the nurses walked about the theatre, rattled instruments, kicked buckets, and thought much of an aseptic, but nothing of a theatre technique. With local anæsthesia, whatever the basal narcosis, this must cease.

* * *

The change is likely even to revolutionise hospital construction and surgical teaching. There is no need to-day for daylight in the theatre; but there is a need for silence. A silence as absolute as that in the Central Tower of the B.B.C. house; a silence that can be felt like that we feel for two minutes on Nov. 11th. And so in the hospital of the future the theatres will be in a central tower, artificially lighted, and with conditioned air, screened from all sounds even of the preparation and anæsthetic rooms. The voice of the surgeon alone will be heard in an island of silence.

When a surgeon teaches during an operation he is certain to point out difficulties, he is likely to illustrate these by cases where he has failed in some detail or has had to modify the operation. Under local anæsthesia all this must stop. Nothing must penetrate through the half conscious mind to suggest the surgeon is anything but infallible. And as he, poor mortal, knows how frail he is, he is reduced to demonstrating anatomical points, and perhaps it is better if he does not even mention these. Thus, if surgical teaching is to continue, a careful demonstration of the operation must be given before it is begun. This will demand more time for each case, so that the surgeon cannot deal with so many in the morning or afternoon unless he neglects to go round his ward to see his patients afterwards. Thus we may find ourselves readjusting ideas as to the number of patients to whom a surgeon can give his personal attention; and we may have to reorganise our wards and give him fewer beds. We do not know what will be the next change in technique to revolutionise surgery as widely as has been done in the memory of those not yet old. We only know that some change will arise and that we must retain an elasticity of mind and our power to use it.

CORRESPONDENCE

ANAHÆMIN IN TROPICAL MACROCYTIC ANÆMIA

To the Editor of THE LANCET

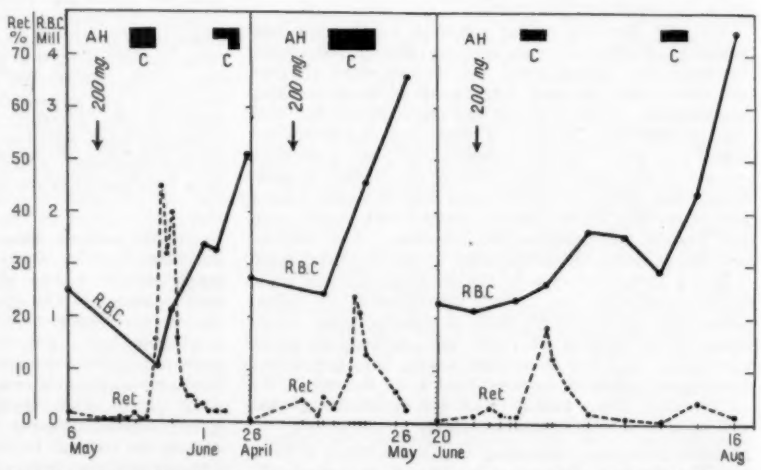
SIR,—In the section on anæmia in this year's *Medical Annual*, the reviewer, Prof. Stanley Davidson, reporting the work of Dr. Lucy Wills and her co-workers (*Lancet*, 1937, **1**, 311), says "the authors believe that, there are two factors in the more crude liver extracts which are of value in the treatment of macrocytic anæmias and that the more highly purified liver extracts may be less efficacious, since they only contain one factor." He adds "in the reviewer's experience no clinical evidence of this danger is at present available."

I have been using anahæmin in the treatment of macrocytic anæmia in India for more than a year and have now encountered a number of cases in which, although subsequently there has been a characteristic response to less highly refined liver extracts, anahæmin has been entirely inactive.

This is not by any means the general rule in "tropical macrocytic anæmia," as there are some cases in which there is a sharp response to anahæmin and yet others in which there is little response to any liver preparation. This fact, in my opinion, shows that the macrocytic hyperchromic anæmias of the tropics are not a homogeneous group, and my co-workers in Calcutta and I consider that the therapeutic test may provide us with a means of differentiating the macrocytic anæmias into ætiologically homogeneous groups. By studying the clinical and pathological findings in each of these groups, we hope to discover some characteristics that will be of practical diagnostic value, as it is obvious that in practice diagnosis should precede and not follow treatment.

Up to the present we have not observed in any one group any outstanding pathological finding or clinical feature that could be said to be characteristic, and therefore until we have accumulated more data we have hesitated to publish any results. However, in view of Prof. Davidson's doubts, which are possibly shared by others, we are preparing a summary of our experience to date with anahæmin, which will be published in India.

The accompanying Chart shows the red cell and reticulocyte counts in three selected cases of macrocytic hyperchromic anæmia in which there was no



Reaction to anahæmin and campolon in three cases of tropical macrocytic anæmia. Ret. = reticulocytes. R.B.C. = red blood-cells. AH = anahæmin. C = campolon (2 or 4 c.cm. daily).

response to anahæmin, but a characteristic response to Campolon.

In all three cases there was hypochlorhydria but not achlorhydria. The indirect van den Bergh test was negative throughout in one case (No. 3); in another (No. 2) it was positive, 4 units, at the first examination but subsequently negative; and in the third case it was negative at first but strongly positive when campolon was given. Sternum puncture showed a hyperplasia of the red cell elements in all three cases: Case 1 had 14·5 per cent. megaloblasts, Case 2 only 4 per cent. megaloblasts but 67 per cent. normoblasts, and Case 3 a marked megaloblastic hyperplasia (26·8 per cent.).

Our experience with anahæmin seems to me to confirm Dr. Wills's suggestion, based on her experiments on the nutritional macrocytic anæmia of monkeys, that the ammonium-sulphate-insoluble fraction of liver extract, which is curative in pernicious anæmia, may be inactive in other forms of macrocytic anæmia in man. It also supports her contention that this anæmia of monkeys is ætiologically identical with one form of human macrocytic anæmia that is common in India.

I am, Sir, yours faithfully,

L. EVERARD NAPIER,
Professor of Tropical Medicine, Calcutta School of Tropical Medicine.

Silchester, Berks, June 27th.

HEART-HOMES FOR RHEUMATIC CHILDREN

To the Editor of THE LANCET

SIR,—I must not mount my hobby-horse again or ride him further; but may I have a few lines of space to reply to Dr. Raven (who treats me very gently), and clarify my complaint of certain prevalent methods of "preventing" rheumatism in children?

Everyone will agree that a child in whom active rheumatism, carditis, or decompensation can reasonably be diagnosed should be kept in bed until bed will do no more good and should then have a well-graded convalescence. Heart-homes, when used for this purpose, are admirable and necessary institutions. Admittedly it may be difficult to be sure whether there is active rheumatism or not but I think a few weeks' observation in bed should almost always suffice to settle that question and I am certain that modern cardiology is competent to decide whether a child's heart is sound or not definitely and quickly in the vast majority of cases. My complaint is that in the name of prevention the urgent duty of diagnosis is shirked, non-committal labels like "potential rheumatism" are attached, and children thus ticketed are forbidden to play games, drill, or swim for long periods though they are up and about and in no sense under treatment, while both they and their parents know well that doubt has been cast on the integrity of their hearts. It is so easy to stick these labels on, so terribly difficult to wash them off again.

As for Captain MacWhirr, I know he hazarded his ship and I do not suggest that any doctor, whatever his personal philosophy, has the right to hazard his patient's life or even his mitral valve; but equally he has no right to lay the foundation of a neurosis by sailing round the matter at issue under cover of "storm strategy" or "preventive medicine." Too much storm strategy, no less than the *nimium fiduciæ* of the Latin primer, *calamitatis solet esse.*

I am, Sir, yours faithfully,

July 1st. A LONDON PRACTITIONER.

HELP FOR CHINA

To the Editor of THE LANCET

SIR,—Nine weeks ago you were good enough to publish a letter from us asking the profession in this country to help in the provision of medical supplies for relief work in China. The response was so gratifying (£100 having been received) that we composed a second letter, more detailed than the first, intending to ask you to publish it as the basis for a wider appeal. However, at this juncture we were delighted to find in your columns a letter, signed by some of the most eminent members of our profession, describing with simple eloquence the heart-breaking conditions in the war-stricken parts of China, and asking for donations to be sent to the Lord Mayor's Fund for the Relief of Distress in China.

We feel that since this matter is now in such competent hands there is no need for our second letter to appear. We have decided to hand over the sum of £100 to the Lord Mayor's Fund, on the understanding that it is administered entirely in favour of the Hong-Kong division of the Chinese Red Cross Society, to help which our appeal was specifically made.

A number of our colleagues have given generously; we thank them whole-heartedly. Others have not yet responded; for them we feel bound to reiterate the urgency of the need, and to commend to their notice the letter signed by some of our most distinguished brethren.

We are, Sir, yours faithfully,

MILLAIS CULPIN,
W. C. W. NIXON,
July 2nd. H. J. SEDDON.

EMERGENCY BEDS

To the Editor of THE LANCET

SIR,—The possession of a name well placed in any alphabetical series brought me the good fortune of being among the first notified of the existence of the Emergency Bed Service, and the least I can do in return is to be among the first to record my appreciation of its working.

A few days ago I wished to get a man with acute appendicitis into hospital. At his request I tried to get him a bed in our local hospital, the Connaught; I waited ten minutes on the telephone while they courteously but vainly tried to find a bed. I then rang the Emergency Bed Service, gave my name and address and the particulars of the patient's age, sex, and diagnosis, and was asked if I had any choice of hospital. I replied "the London" and was asked, if this were unavailable, if the patient would consent to go to the Poplar or the London Jewish Hospital. I assented to this, and the clear female voice at the other end asked me to ring off and promised to ring me within five minutes. Actually she rang back in less than two minutes to say that a surgical bed had been reserved at the London Hospital. As the case was out of the L.C.C. area we had to make our own ambulance arrangements.

The bed was reserved easily and courteously, and I was spared the time and trouble of ringing various hospitals and waiting while the appropriate house surgeon was fetched. To the busy general practitioner the Emergency Bed Service, if it runs as smoothly as this, is going to be of great value.

I am, Sir, yours faithfully,

Leytonstone, E., July 3rd. SIDNEY ABRAHAMS.

A "HARMLESS" HAIR DYE

To the Editor of THE LANCET

SIR,—I have just seen in consultation a professional hairdresser who used, on June 28th, 1938, for the first time a new dye. It is not an aniline dye; it is sold as harmless. (I enclose a pamphlet which says this and in which is an analyst's report saying that the sample "is a very efficacious hair dye of a harmless character. It may be used as directed without any ill effects resulting.")

The hairdresser, as soon as he used the second component of the dye, felt a sting of his fingers. This was quickly followed by a local rash, which under the treatment of his doctor is now subsiding. An analysis of this dye by a public analyst tells me that it contains 10·2 per cent. of potassium dichromate. I think it is interesting to record this acute attack of dermatitis due I think to potassium dichromate solution used as part of a "harmless" hair dye.

I am, Sir, yours faithfully,

Harley-street, W., July 4th. W. J. O'DONOVAN.

OBITUARY

SIR COLIN MACKENZIE, M.D. Melb. F.R.S.E.

Sir Colin Mackenzie, whose death at the age of 61 is reported from Melbourne, retired only a few months ago from the post of director of the Australian Institute of Anatomy. Born in Kilmore, Victoria, the younger son of John Mackenzie, William Colin was educated at Melbourne where fellow-students at the university recall him as a genial companion known as "Bricky" for his crop of bright red hair. He qualified M.B. in 1898, taking his M.D. in 1901. He had an unusually varied career which included a spell of general practice in his youth, academic work as lecturer and examiner in anatomy at Melbourne, a period of active concern with the practical methods of re-educating limbs whose function was impaired as the result of anterior poliomyelitis or of traumatic injury to nerves, and, in his last phase, a return to the study of anatomy from the comparative standpoint. His publications—on the action of muscles, intellectual development, and the erect posture, on early treatment of infantile paralysis, and on the comparative anatomy of Australian fauna—reflect his interests at different periods. His pioneer work in stimulating interest in physical re-education has been fruitful. More than 30 years ago, when few of his contemporaries in Australia were giving consideration to the principles underlying the management of postural deformities and functional defects following paralysis of muscles, Colin Mackenzie sought to ascertain these principles and preached the doctrine of rest, utilisation of residual power, and control of the antagonist muscles as essential factors in treatment. During the war he was given facilities by Sir Robert Jones to test his theories of re-education at various orthopædic centres and for a time he held the appointment of consulting orthopædist at the military hospital at Shepherd's Bush. Of recent years Sir Colin accumulated a large and valuable collection of the rarer marsupials which he made over to the Commonwealth Government. The specimens were housed at the institute of anatomy of which he became the first director. Many scientific honours came to Sir Colin, including the presidency of the Royal Society of Australia. He was made a knight in 1929.

HUGH WOODS, M.D. Dubl., D.P.H.

Dr. Hugh Woods, who died on July 3rd at the age of 81, was the second son of Rev. R. M. Woods of Whittington, Oswestry. As a boy he suffered from disease of the periosteum which left him with a rigid ankle, and he was taught at home by his father until he went to Trinity College, Dublin, where he became a senior moderator in experimental science. After qualification in 1886 Dr. Woods carried on general practice in London for many years, but retained his scientific interests and published technical articles and books. He served as member of the council of the Medical Defence Union from 1890 to 1892 and he took a prominent part in the formation of the London and Counties Medical Protection Society, being one of the original members of its council. From 1892 to 1902 he acted as honorary secretary of the society and for the next 30 years as its general secretary, devoting his whole energy to its service. Those who sought his advice or assistance found him kindly, courteous, and extremely practical, and realised that any matter left in his hands would be capably and conscientiously dealt with. He was particularly zealous and determined in waging war against any attempt to undermine the good repute of the medical profession. Unqualified persons who attempted to give the public the impression that they were registered practitioners of medicine learnt to recognise and fear his skill in exposing wilful deception. Since his retirement as secretary of the society he has continued to serve as a vice-president on its council where his good sense and judgment will be greatly missed.

EDITH STONEY, M.A.

THE death of Miss Edith Stoney will recall to former students of the London (R.F.H.) School of Medicine for Women a gentle kindly figure who was in charge of the physics department of the school for many years before the war. Her lectures on physics mostly developed into informal talks, during which Miss Stoney, usually in a blue pinafore, scratched on a blackboard with coloured chalks, turning anxiously at intervals to ask "Have you taken my point?" She was perhaps too good a mathematician—having been bracketed with the seventeenth wrangler in Part I of her tripos—readily to understand the difficulties of the average medical student, but experience had taught her how distressing these could be. She besought her class to ask questions, however elementary, and answered them (when possible) with untiring interest if not always with precision. During the war Miss Stoney ran an X ray plant in tent hospitals in France and later, with her own portable engine, in Serbia when she was attached to the Scottish Women's Hospital unit. After a period as lecturer at King's College for Household Science she retired to live with her sister, the late Dr. Florence Stoney, at Bournemouth. She continued to take the keenest interest in the work of women in medicine and in science and has given practical expression of this interest in the gift of research studentships.

CALLS TO THE BAR.—On June 29th the following were called to the bar: Dr. W. J. Vickers and Dr. Carol Sims (Inner Temple); and Dr. C. Fraser Brockington (Middle Temple).

PUBLIC HEALTH

DENTAL CARIES IN LEWIS AND PARTS OF WEST ROSS-SHIRE

BY J. D. KING, Ph.D. Sheff., L.D.S. Eng.

IN 1920 E. Mellanby drew attention to a statement in the Carnegie Report on the Physical Welfare of Mothers and Children (1913) that in the Isle of Lewis "the most striking fact in the adult population is their beautiful teeth—a testimony to the absence of rickets in infancy." On Sir Edward Mellanby's advice, in July, 1937, I spent a short time in Lewis and there examined the mouths and throats of 124 adults and children.* This small investigation and the general impression I gained of the mode of living and diet of the people convinced me that a larger-scale study would be of value, and, with the financial assistance of the Medical Research Council, I was able to make such a study during the last three months of 1937.

The main purposes of the investigation were first to ascertain the incidence and extent of diseases of the mouth and throat, and secondly to gain as much idea as possible in the time available of the factors which might influence the health of these parts of the body. The present report will be confined to a brief survey of some of the main findings in regard to the incidence and extent of dental caries and hypoplasia in pupils of primary and secondary schools. A more detailed account will be published when more of the data are tabulated and analysed.

CONDITIONS ON THE ISLAND

The island of Lewis, or the Lews, where the main investigation was made, forms the northernmost part of the Outer Hebrides. Lewis is some 45 miles long, 15 miles in average breadth, and 30 miles in extreme breadth, having an area of 417,460 acres. Although at its nearest point it is only about 24 miles west of the mainland, the usual steamer route from Kyle of Lochalsh to Stornoway entails travelling over 70 miles up the Inner Sound and across the Minch, which takes about five hours in good weather. The passenger steamer makes the return journey six times a week.

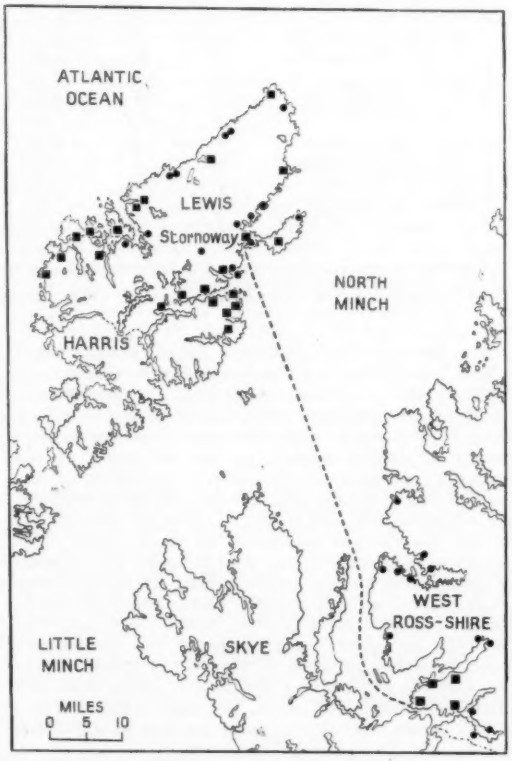
The fisheries, though less than in pre-war years, and the tweed industry are the mainstay of the people. Potatoes, oats, barley, and some turnips are the main crops, green vegetables not being generally appreciated. Cattle-raising and sheep-farming are also carried on and many of the crofts possess some poultry. At one time most families in the country districts kept two or more cows, but in recent years improved means of communication both by land and sea have resulted in the introduction of condensed milk and other commodities so that the local production of milk, butter, and cheese has steadily fallen. The consumption of fish has also fallen considerably, especially in the town of Stornoway.

The 1931 census figures give the population of the island as 25,205 and that of Stornoway town as 3770, as compared with 28,378 and 4079 respectively in 1921, and 29,603 and 3806 in 1911. The total school population is now 4254, of which 3252 are in the country schools, and 571 in the primary and 431 in the secondary department of the town (Stornoway) school.

* In this number are included some of the members of the 23 families living near Stornoway whose diets were analysed by Miss J. B. Beveridge under the direction of Prof. E. P. Cathcart.

THE INVESTIGATION

Stornoway, the capital and only town in the island, formed the headquarters, from which schools in the various parts of Lewis (see Figure) were visited daily by car. It seemed especially important to divide the schools into two groups: (1) urban, represented by the Nicolson Institute, Stornoway; and (2) rural, represented by those more or less remote from Stornoway. This division has been



Area of the investigation. Black squares = schools visited; circles = schools omitted.

stressed in the Tables of results not only in the case of pupils of the *primary* schools but also in the *secondary* department of the Nicolson Institute (Stornoway). Pupils who receive their earlier education in the country primary schools can continue their studies at the Nicolson senior school, and if necessary are aided financially so that they can live in Stornoway in suitable lodgings or in the boys' and girls' hostels. It was thus possible to separate the *secondary* pupils into those born and bred in Stornoway and those born and bred in country districts.

In order to compare the findings in Lewis with those elsewhere it was further decided to visit some country schools on the West Ross-shire mainland. Unfortunately it was only possible to examine a relatively small number of children because the roads to several suitable schools were blocked by snow and ice. These children have however been included in the results, although few inferences can safely be drawn from them.

TABLE I—COMPARISON OF THE INCIDENCE AND EXTENT OF DENTAL CARIES IN THE PRIMARY SCHOOLS OF COUNTRY AND TOWN DISTRICTS OF LEWIS AND COUNTRY DISTRICTS OF WEST ROSS-SHIRE MAINLAND *

Age-group (years).	District.	All teeth.			Deciduous teeth.			Permanent teeth.		
		Number.	Carious (per cent.).	Av. caries figure.	Number.	Carious (per cent.).	Av. caries figure.	Number.	Carious (per cent.).	Av. caries figure.
Under 6	Lewis (country).	1,326	18·4	0·43	1,261	19·2	0·45	65	3·1	0·03
	Lewis (town).	514	45·1	1·09	499	45·9	1·11	15	20·0	0·33
	Mainland (country).	241	46·9	1·12	237	47·3	1·13	4	25·0	0·50
6–9	Lewis (country).	7,318	19·0	0·44	4,882	24·9	0·61	2,436	7·2	0·11
	Lewis (town).	2,088	40·3	0·96	1,343	52·0	1·32	745	19·5	0·30
	Mainland (country).	781	43·1	1·08	508	57·3	1·51	273	16·8	0·30
9–11	Lewis (country).	5,062	14·6	0·31	1,924	25·6	0·63	3,138	7·8	0·12
	Lewis (town).	1,253	33·3	0·80	392	60·2	1·63	861	21·0	0·42
	Mainland (country).	387	26·1	0·62	126	55·6	1·47	261	11·9	0·21
11–13	Lewis (country).	5,602	10·0	0·20	768	25·3	0·63	4,834	7·6	0·13
	Lewis (town).	1,397	21·8	0·42	110	55·5	1·57	1,287	15·9	0·32
	Mainland (country).	520	24·0	0·54	59	35·6	0·92	461	22·6	0·50
13–15	Lewis (country).	4,569	8·9	0·16	176	19·3	0·47	4,393	8·5	0·14
	Lewis (town).	456	18·9	0·40	3	33·3	1·00	453	18·8	0·40
	Mainland (country).	269	32·0	0·72	7	71·4	2·00	262	30·9	0·69
All ages.	Lewis (country).	23,877	14·0	0·30	9,011	24·2	0·59	14,866	7·9	0·13
	Lewis (town).	5,768	33·0	0·76	2,347	52·2	1·34	3,361	19·6	0·35
	Mainland (country).	2,198	34·7	0·83	937	53·3	1·37	1,261	20·9	0·44

In 14 primary (country) school pupils over the age of 15 the respective figures were as follows: total permanent teeth, 386; 5·7 per cent. carious; average caries figure, 0·10.

* Tables I and II include teeth known to have been previously extracted for caries.

The mouths were examined with an illuminated mirror and probe and the findings were noted on a separate chart for each individual. A record was made of the presence and state of eruption of the teeth; alignment and occlusion; presence and extent of dental caries; surface structure of the enamel; attrition of the teeth; condition of the gums; and presence and amount of tartar deposit. In addition the incidence of *Bacillus acidophilus* in the mouth was estimated in some cases. The standards and criteria for dental caries and enamel structure were similar to those used by M. Mellanby (1934) and her colleagues. Thus, the hypoplasia recorded in this investigation includes not only the generally recognised and comparatively uncommon form (hereafter referred to as "gross hypoplasia") but also the much more prevalent type of defective calcification described by M. Mellanby (1923, 1927).

The present report is based on the examination of:—

(*a*) Primary schools—
1030 pupils of 21 Lewis country schools;
250 pupils of the only town school in Lewis;
96 pupils of 4 West Ross-shire (mainland) country schools.

(*b*) Secondary school (Stornoway)—
110 pupils who were born and lived up to the age of 11–14 in country districts of Lewis;
140 pupils born and bred in town districts of Lewis.

TABLE II—COMPARISON OF THE INCIDENCE AND EXTENT OF DENTAL CARIES IN COUNTRY- AND TOWN-BRED PUPILS ATTENDING THE LEWIS (STORNOWAY) SECONDARY SCHOOL *

Age-group (years).	Home district of pupils.	Permanent teeth.		
		Number.	Carious (per cent.).	Av. caries figure.
11–13	Country.	279	8·2	0·16
	Town.	248	27·8	0·58
13–15	Country.	997	14·2	0·27
	Town.	1809	26·0	0·54
15–17	Country.	965	15·4	0·29
	Town.	1240	30·8	0·67
17–20	Country.	733	18·7	0·38
	Town.	392	23·0	0·51
All ages.	Country.	2974	15·2	0·29
	Town.	3689	27·4	0·58

TABLE III—DEGREE OF HYPOPLASIA IN RELATION TO CARIES SUSCEPTIBILITY IN LOWER 2ND DECIDUOUS AND 1ST AND 2ND PERMANENT MOLARS (ALL PRIMARY SCHOOLS)

Age-group (years).	Type of tooth.	Grade of hypoplasia.									
		0		1		2		3		Gross.	
		Number of teeth.	Teeth carious (per cent.)	Number of teeth.	Teeth carious (per cent.)	Number of teeth.	Teeth carious (per cent.)	Number of teeth.	Teeth carious (per cent.)	Number of teeth.	Teeth carious (per cent.)
9–11	Lower second deciduous molar.	158	1·3	169	25·4	111	70·3	13	92·3	1	Nil.
12–14	Lower first permanent molar.	Nil.	Nil.	223	17·5	238	51·3	94	83·0	10	33·3
13–14	Lower second permanent molar.	16	Nil.	78	7·7	155	18·7	88	60·2	Nil.	Nil.

FREEDOM FROM DENTAL CARIES

Primary schools.—In the country districts of Lewis 28·1 per cent. of the children were free from caries, as far as could be judged by careful mirror and probe examination, compared with 2·0 per cent. of the Lewis town and 6·3 per cent. of the mainland country pupils. Apart perhaps from certain small institutional communities, *it is probably true that in no other part of the United Kingdom can it be said that of 1030 children between the ages of five and fifteen years more than a quarter have mouths without any decayed teeth.* From evidence at present available, the usual figures for freedom from caries in untreated primary school-children vary from 2 to 5 per cent. or less.

Secondary school (*Stornoway*).—Of the children born and bred in the country, 24·5 per cent. were free from caries up to the age of nineteen years or more, compared with 7·1 per cent. of children brought up in the town. It is true that the number of country-bred pupils examined was small (110), but it seems almost certain that if a corresponding group of untreated individuals were taken at random from any other community in the country the proportion of caries-free mouths would be much less.

INCIDENCE AND EXTENT OF DENTAL CARIES

Primary schools.—Table I shows the incidence and extent of caries per tooth present or known to have been previously extracted for caries. As would be expected from the previous paragraph, in both deciduous and permanent dentitions the country school pupils of Lewis have a much higher resistance to the onset and spread of the disease than do the Stornoway town and mainland country pupils. Thus in the Lewis country districts the incidence for all teeth is 14·0 per cent., as compared with 33·0 per cent. in Stornoway and 34·7 per cent. on the mainland, the extent of caries, expressed as the average caries figure, being 0·30, 0·76, and 0·83 respectively.

Secondary school (*Stornoway*).—In Table II comparison is made between country- and town-bred children. The superiority of the former as regards resistance to the onset (15·2 per cent. carious for all ages) and spread of caries (caries figure 0·29) over the town-bred pupils (27·4 per cent. teeth carious, caries figure 0·58) is evident.

DENTAL CARIES AND HYPOPLASIA

In Table III is seen the relationship of tooth structure to caries susceptibility in the lower second deciduous and first and second permanent molars of all the primary children examined. In a subsequent report it is proposed to extend the analysis for other types of teeth in both jaws and for all age-groups in which the number of teeth is sufficiently large. It should be noted that of the 158 lower deciduous second molars of good structure (hypoplasia Grade 0), only 1·3 per cent. were carious up to the age of nine to eleven years, whereas in the more defectively calcified teeth (Grades 1–3) the caries incidence rises progressively to 92·3 per cent. Similarly, in the lower permanent first and second molars, the susceptibility to decay is related to the degree of hypoplasia; moreover, although these permanent teeth have been present in the mouth for a comparatively short time, the incidence of caries in the Grade 3 teeth has risen to 83·0 and 60·2 per cent. respectively. It is of interest that only 1 lower deciduous molar and 10 lower first permanent molars were affected by gross (text-book) hypoplasia, and of these 3 were carious.

Two other points of interest may be briefly mentioned here. First, it appears from the data already analysed that there has been a tendency for the teeth of the Lewis children to deteriorate progressively during the post-war years; this is now being more closely studied. Secondly, it was found that the incidence of dental attrition, even of the lowest grade, was for all practical purposes negligible in all of the mouths examined and this is considered to be due to the small proportion of hard foodstuffs in the dietary even of the relatively caries-resistant Lewis country children. This is interesting in view of the common belief that the consumption of hard fibrous food is necessary for the prevention of dental caries.

SUMMARY

An investigation was made into the incidence and extent of dental caries and hypoplasia in schools of the island of Lewis and of part of the West Ross-shire mainland.

Primary and secondary school pupils born and bred in the Lewis country districts were much less susceptible to dental caries than those brought up in the Lewis town or mainland country districts.

A distinct relationship was found between tooth structure and susceptibility to decay in the lower second deciduous and first and second permanent molars.

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Mellanby, M. (1923) *Brit. dent. J.* **44**, 1.
— (1927) *Ibid*, **48**, 737, 1481.
— (1934) *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 191.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Government Milk Policy

IN the House of Commons on July 4th Mr. W. S. MORRISON, Minister of Agriculture, in moving the second reading of the Milk (Extension and Amendment) Bill, explained that the Government's proposals for permanent legislation were issued in a White Paper, and were in an advanced state of preparation, but owing to pressure on parliamentary business it would not be possible to pass this long-term legislation this session.

In the meantime it was necessary to retain the present system of assistance to the milk industry for another twelve months, and that was the purpose of the present Bill. The Exchequer grants were extended for twelve months, and included the milk-in-schools scheme. Before the scheme began about 900,000 children were receiving milk in schools, and it was estimated that now about 2,750,000 children were participating. Over 23,000,000 gallons of milk were consumed in England and Wales under the scheme during the year ended last September, and it was likely that in the next twelve months the consumption would be 25,000,000 gallons. The merits of the scheme had undoubtedly been proved, and the Government attached great importance to it. It was hoped to introduce in the autumn a scheme under which the local authorities would be able to secure milk at reduced prices for their maternity and child welfare services. Local authorities would thus be able to extend their present schemes and make milk available to expectant and nursing mothers and to children under school age, either free or at reduced prices.

Still-Births (Scotland) Bill

In the House of Lords on July 5th Lord ALNESS moved the second reading of the Registration of Still-

Births (Scotland) Bill, which has passed through the House of Commons. He said that stillbirths to-day were registered by law in every civilised country, with the exception of Palestine, Ireland, and Scotland. The measure could be justified not only on statistical but on medical and humanitarian grounds. Viscount DAWSON OF PENN, in supporting the Bill, said that in these days of a smaller birth-rate it was necessary to do all that was constructively possible to secure that the babies born were of the best. Every baby who died represented a failure and the cause could only be discovered by a study of the whys and wherefores of the failure. In 1934 43,670 infants in England died at or soon after birth, and in 1936, in Scotland, it was estimated that there were 4000 such deaths. Civilisation had reduced the death-rate, but it had also brought down the birth-rate, with the result that the turnover to-day was much smaller. No one wanted a hopeless infant to survive, but there were a number of potentially fit children who, through want of knowledge and care, were lost to the community. The present Bill would secure that more lives were saved. The loss of children at or just after birth occurred in all classes of the community, and was therefore, in all probability, due in large part to lack of knowledge. In addition to obtaining mere statistical information, it would also be of advantage if the Department of Health for Scotland would institute a close study of selected groups of children and would ask the Research Department to take action. No investigation in connexion with these deaths was worth much unless post-mortem examinations were carried out, and it would be of value if post-mortem examinations were encouraged. Lord STRATHCONA and MOUNT ROYAL said that the Government viewed the Bill sympathetically and would welcome its passage. He would bring Lord Dawson's observations on the question of research to the notice of the Department.

The Bill was read a second time.

QUESTION TIME

WEDNESDAY, JUNE 29TH

Forced Marriages in British Dependencies

Miss RATHBONE asked the Secretary of State for the Colonies whether the information received from the governments of British dependencies as to forced marriages of girls and the arrangements made for preventing, or penalising those responsible for, such marriages had yet been published, and in what form; and, if not, when publication might be expected.—Mr. MALCOLM MACDONALD replied: I propose to present to Parliament about the middle of July a Command Paper giving information on this subject.

Juvenile Labour Conditions in African Colonies

Dr. SUMMERSKILL asked the Secretary of State for the Colonies what was the earliest age that children were permitted to work underground in the African colonies; and what was the maximum number of hours worked by children in the mines.—Mr. MALCOLM MACDONALD replied: On the Gold Coast and in Sierra Leone the minimum age is 14 years, in Nigeria 16, in Kenya 12, and in Northern Rhodesia 12. In Tanganyika draft legislation at present under consideration proposes 14 years as the minimum age. I understand that very little juvenile labour is employed in mines in these dependencies. I have no detailed information as to the maximum number of hours which they are permitted to work when so employed, but I am making inquiries into the matter.

The Noise Nuisance

Mr. SORENSEN asked the Home Secretary how many local authorities in the metropolitan police area had adopted by-laws dealing with or restricting the nuisance of noise, including the use of loud-speakers both inside buildings or on the public highway; under what other powers the police could at their discretion prevent such noise; and whether he would consider either legislation or other steps in conjunction with local authorities to prohibit loud-speakers after 10 P.M. in flats, mansions, and similar dwellings.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: As regards noises in the streets, there are provisions under which the police can take action in certain cases and I am sending the hon. Member particulars of these provisions. As regards noises in private premises, it would be impracticable to place on the police the responsibility of deciding when such noises constitute a nuisance. In such cases any action must be taken by the persons annoyed, and about sixty authorities in the metropolitan police district have made by-laws under which, after a complaint by three householders, proceedings can be taken against persons using loud-speakers in such a way as to cause a nuisance to occupants or inmates of any premises in the neighbourhood. Any total prohibition of such instruments after a specified hour would be open to the objection that it would apply not only to cases where a nuisance is caused but also to cases where the instrument is used in such a way as to be unobjectionable.

Juvenile Delinquents and Psycho-analysis

Mr. CASSELLS asked the Secretary of State if he was now prepared after due investigation to permit of judges in the Scottish Inferior Courts enlisting the services of psycho-analysts in cases where the treatment of juvenile delinquents arose.—Mr. WEDDERBURN, Under-Secretary of State for Scotland, replied: The attention of courts in Scotland has already been drawn to their powers to require young offenders to be examined by properly qualified experts, and I have no reason to think that these powers are not exercised in all appropriate cases.

Infantile Paralysis

Sir ARNOLD WILSON asked the Minister of Health what investigations, wholly or partly financed by the Exchequer, were at present in progress in this country into the cause and cure of infantile paralysis.—Mr. ELLIOT replied: A member of the staff of the Medical Research Council is giving his whole time to the investigation of this and cognate diseases. A statement as to the progress of this work will be found in the Annual Report of the Council for the year 1936–37.

Family Allowances and Nutrition

Mr. BOOTHBY asked the Prime Minister whether he would set up a Royal Commission to examine the question of family allowances.—Mr. CHAMBERLAIN replied: I have given careful attention to the representations on this subject which have been made in the House and elsewhere. As at present advised I do not think that the time has come to make an inquiry of the kind proposed into this subject.—Mr. J. GRIFFITHS: Will the Prime Minister bear in mind that there is considerable and deep-seated hostility among the trade unions to any system of family allowances which is borne by the industry? In the meantime will the Government use their influence to raise wage standards?—Miss RATHBONE: If the Prime Minister does not want to appoint a Royal Commission, will he consider appointing some other form of inquiry in view of the fact that it is now two years since the Statutory Committee on Unemployment Insurance called attention to the necessity for such an inquiry?—Mr. CHAMBERLAIN: It is not so much a question of the form of the inquiry as of whether there should be an inquiry.

THURSDAY, JUNE 30TH

Industrial Eye Injuries

Mr. DAVID ADAMS asked the Home Secretary whether he was aware that it had been estimated that each year in Great Britain some 250,000 eyes were injured in the course of industrial employment, many of them resulting in permanent damage to sight; and what steps the Government were taking to enforce preventive measures generally and especially in the coal-mining industry.—Sir SAMUEL HOARE replied: The information in my department does not suggest that the number of eye injuries in industrial employment can be anything like 250,000 a year, but undoubtedly the number is very considerable and the matter is one of serious concern. In addition to some special provisions dealing with the subject in existing codes of regulations, there is a section in the new Factories Act as to the provision of goggles or screens and I have

already issued in draft some regulations applying that section to certain processes. In many cases, however, screening is impracticable and there is great reluctance on the part of the workers to wear goggles, and their coöperation is essential if preventive measures are to be generally secured. The Act of 1937 also contains new provisions as to the lighting of factories, which should have an important effect in preventing eyestrain. As regards the coal-mining industry, the hon. Member should address his inquiry to the Secretary for Mines.

Hospital Accommodation at Bridgend

Mr. EDWARD WILLIAMS asked the Minister of Health whether, in view of the Government munition works which were under construction and the increased number of accidents and sickness to an increased number of residents thereby entailed, he would inquire into the hospital accommodation of Bridgend and district.—Mr. ELLIOT replied: Increased hospital provision for the region which includes the district in question is now being made.

Death Certificate Issued for a Live Man

Colonel BURTON asked the Minister of Health whether he could state the circumstances under which a certain Mrs. Martha Brabben obtained a certificate of the death of Mr. James Alfred Douthitt, of Hamilton Street, Camden Town, registered his death, and caused arrangements to be made for his funeral when in fact he was still alive.—Mr. ELLIOT replied: Full inquiry has been made into this matter. Mrs. Brabben, Mr. Douthitt's landlady, seeing Mr. Douthitt lying motionless came to the mistaken conclusion that he was dead. In this belief she informed Mr. Douthitt's medical attendant who, being acquainted with Mr. Douthitt's medical condition, issued a certificate of cause of death. Mrs. Brabben then took steps for the registration of the death; and since she was a fully qualified informant in her capacity as "the occupier of the house in which, to her knowledge, the death took place" the registrar duly registered the death upon her information. Mr. Douthitt proved to be alive on Mrs. Brabben's return home.

MONDAY, JULY 4TH

Opium Traffic in China

Mr. DAVID ADAMS asked the Prime Minister whether his attention had been drawn to the reply by the Japanese delegate at the committee on traffic in opium in its meetings at Geneva during the present month to the effect that 1500 chests of Iranian opium, transported by a Japanese ship from the Persian Gulf to China, were imported by the Manchukuo Government for the purpose of consumption by the registered addicts of that country; and whether he would endeavour to ascertain whether the numbers of such registered addicts were increasing under Japanese guidance.—Mr. BUTLER replied: As regards the first part of the question, this information was communicated to His Majesty's Ambassador at Tokyo by the Japanese Government, to whom an inquiry had been addressed as to the destination of the ship when it left Bushire. As regards the second part of the question, I am not in a position to make any statement, nor is it likely to be possible to obtain the information desired.

Mr. DAVID ADAMS asked the Prime Minister whether his attention had been drawn to statements by the Japanese delegate at the committee on traffic in opium that of 2900 chests ordered by Japanese interests in the first three months of 1938, 300 chests were imported by a Japanese firm through Shanghai, these 300 chests being permitted by the North China provisional government in conformity with existing opium conventions; and whether, in view of the fact that existing conventions appeared to allow an increasing import of dangerous drugs into parts of China under Japanese control, the British Government would press for the most rigid interpretation of these conventions, with a view to preventing a systematic demoralisation of a very large number of people.—Mr. BUTLER replied: Yes, Sir. My attention was drawn to the statement made by the Japanese delegate at Geneva. As, however, he declared that the Japanese firm acted solely as shipping agents, no technical breach of the 1925 Convention has been committed by the Japanese Government. As, also, the Convention of 1931, which limits the amount of manufactured drugs which may be imported by each country during the year, does not apply to raw opium, the tightening up of existing regulations would not achieve the object which the hon. Member has in mind.—Mr. ADAMS: Does the Under-Secretary not agree that this Convention appeared to allow increasing imports of these dangerous drugs into China and cannot H.M. Government take action in the matter?—Mr. BUTLER: I fully realise the gravity of the position, and I regret that the conventions do not cover the sort of incident which the hon. Member brought to our notice.—Lieut.-Commander FLETCHER: Will the report of the proceedings at the League on this subject be considered, and is there any doubt that the Japanese Government are encouraging the drug traffic in China with a view to demoralising the Chinese?—Mr. BUTLER: The whole matter is under close consideration.—Mr. A. HENDERSON: Will H.M. Government work in close coöperation with the United States Government to try to check this horrible traffic?—Mr. BUTLER: Any steps we can take to check this traffic in coöperation with any government will be necessary and important.—Mr. THORNE: Is it not true that while we are considering these questions the Japanese are making the Chinese all drunk?—No further answer was given.

Supply of Liquid Milk to School-children

Mr. DUNN asked the Minister of Agriculture the parts of England and Wales where liquid milk was not being provided for school-children; and what action had been taken with the Milk Marketing Board to correct this.—Mr. KENNETH LINDSAY, Parliamentary Secretary to the Board of Education, replied: Liquid milk is being provided for school-children in all or some of the public elementary schools in all the 315 local education authority areas in England and Wales with the exception of the Scilly Isles, Morecambe, and Pudsey. In Morecambe and Pudsey the absence of provision for the supply of liquid milk is not due to such milk being unavailable but to a preference in these areas for dried milk, so that no purpose would be served by taking up the matter with the Milk Marketing Board.

Research in Use of a New Drug

Mr. DAVID ADAMS asked the Chancellor of the Duchy of Lancaster, as representing the Lord President of the Council, if he was aware that the firm of May and Baker Limited were obliged to refuse requests for supplies of newly discovered chemical compounds, because of the dangers involved, until further research had been carried out; and what steps he was taking to expedite the necessary research in this and similar cases.—Earl WINTERTON replied: It is the ordinary and necessary practice in the case of new drugs that they should in the first place be subjected by specialists to carefully controlled trials, as regards their value and safety, in order to ascertain whether the medical results warrant production on a large scale for general distribution. The hon. Member may have particularly in mind a new compound which is being tried in the treatment of pneumonia, and about which the firm named recently published a statement that the work was still in an experimental stage. The manufacturers have not so far thought it necessary to seek the aid of the Medical Research Council in this case, but it is understood that the requisite investigations are in active progress.

TUESDAY, JULY 5TH

Treatment of Schizophrenia

Mr. SORENSEN asked the Minister of Health whether his attention had been drawn to the cure of schizophrenia by cardiazol injections; whether this cure was being applied in all public mental hospitals; how many hitherto uncured cases had been cured by this method of treatment; and whether the Board of Control had an approximate estimate of the number and proportion of patients who were likely to be cured or effectively relieved by the treatment.—Mr. BERNAYS replied: Yes, Sir. This treatment has already been investigated by two medical commissioners of the Board of Control, and their report is in preparation. The treatment, which is still in the developmental stage, is being applied in a considerable number of public mental hospitals but information is not at present available upon the remaining points raised in the question.

MEDICAL NEWS

University of Cambridge

Elmore medical research studentship.—This studentship is open to men graduates of any university who were born at any place within the British Empire other than Scotland. The appointment will be for two years in the first instance and the commencing salary is £300 a year. Further information may be had from the regius professor of physic, under whom the scholar will work. Applications should also be sent to him at the department of medicine not later than August 1st.

Benn W. Levy research studentship in biochemistry.—Applications for the studentship should be addressed to Sir Gowland Hopkins, F.R.S., at the school of biochemistry before July 16th.

University of Liverpool

At recent examinations the following candidates were successful :—

M.D.

A. Dodd, Jannett C. Hay, and C. H. Stewart-Hess.

FINAL EXAMINATION FOR M.B., CH.B.

D. A. Hunt and E. L. Salingar (with second-class honours).

Part III.—H. G. A. Almond, H. Alstead, H. Angelman, C. T. Baynes, Patricia M. Bennett-Jones, A. L. Black, D. W. Bracey, H. Braslavsky, B. H. Brindle, B. Carruthers, J. W. Crowther, H. Dakin, R. B. Davies, J. Donnelly, D. W. Forgan, Mary W. Gaskell, K. B. Gibson, J. Griffith, Anne F. M. Heaney, D. R. Holden, R. S. Holgate, E. P. Houghton, G. O. Hughes, Brenda M. Jones, P. Jones, R. J. Keating, J. C. Kee, J. C. Kitchin, E. Leather, J. Mills, J. Moroney, A. Nachmanovitz, J. H. Newmark, P. J. O'Flynn, E. N. Owen, R. A. C. Owen, Geraldine M. H. Paul, B. I. Phillips, Hilda C. Podmore, J. G. Pritchard, W. Pritchard, E. B. Riding, D. J. Roberts, R. H. Roberts, G. M. S. Ryan, G. Sanderson, Joyce M. Scholefield, V. K. Summers, R. J. D. Temple, Lucy H. E. Walker, R. Watson, J. H. D. Wetherell, R. H. White-Jones, A. H. Williams, C. J. Williams, Gwendoline Williams, I. P. Williams, Joan S. Wood, E. G. Wright, G. Wynne-Griffith, and M. Wynroe.

D.P.H.

Part I.—E. W. Evans.

Part II.—A. B. Concanon, L. R. L. Edwards, A. J. Gill, A. L. Smallwood, and Margaret C. Winter.

D.T.M.

P. B. Pillay and M. H. Shah.

D.T.H.

F. Jacusiel, K. Jilani, J. L. Lanceley, and J. R. Robertson.

D.M.R.E.

Part A.—B. O. Jarrette.

Part B.—G. E. Church, B. O. Jarrette, N. A. Lawler, and F. Pygott.

University of Birmingham

At a congregation held on July 2nd the honorary degree of doctor of laws was conferred on Dr. Robert Hutchison, P.R.C.P., Sir Edward Mellanby, secretary to the Medical Research Council, Lord Nuffield, and Sir Cuthbert Wallace, P.R.C.S. The degree of doctor of medicine was conferred ex officio on Dr. J. F. D. Shrewsbury, reader in bacteriology in the university. The following degrees and diplomas were also conferred :—

M.D.—J. H. Ebbs.

M.D.S.—H. T. Roper-Hall.

M.B., Ch.B.—W. G. Mills (with first-class honours); A. G. Arnold, Katharine M. Banks, J. D. C. Gowans, D. R. Humphreys, Peter Parry, and A. B. Watson (with second-class honours); J. O'D. Alexander, C. S. Ashwell, L. W. Blundell, A. E. Chaplin, Dorothy M. Cooper, T. W. B. Cull, J. E. B. Elliott, J. B. Farquhar, R. E. Gibbins, Rita Gleiberman, H. W. Hickman, J. H. Hicks, D. B. Jagger, P. H. Kendall, Dorothy E. Markham, A. T. Marshall, T. J. Montgomerie, J. F. Newman, G. R. Newns, Catherine M. Osler, Marian L. Owen, A. M. Wadsworth, J. F. Wilkinson, and Winifred Wynne.

Diploma in Dental Surgery.—H. J. Harrison, G. C. Kerby, D. J. S. McIlveen, and S. J. Webb.

Dr. Thelma Mouat has been appointed lecturer in bacteriology in the university.

Lord Nuffield has given £60,000 for the building and equipment of a new physics laboratory to supplement the present one. The new building will cost £40,000 and the rest of the money will be used to maintain the new block and to found a research fellowship in physics.

University of Manchester

Dr. Rupert Sykes has been appointed warden of Lister House and Dr. S. T. Cowan lecturer in bacteriology. The Sheridan Delépine fellowship in preventive medicine has been awarded to Dr. H. L. Settle.

University of Wales

At recent examinations the following candidates were successful :—

D.P.H.

Part I.—Jennet Evans, S. H. Graham, Anne E. M. Herbert, E. W. Kinsey, and Mary M. M. Llewellyn.

University of Glasgow

On July 1st the following degrees were conferred :—

M.D.—R. MacI. Millen and J. P. J. Paton (with commendation).

B.Sc. in Pharmacy.—Kathleen M. Calver (with first-class honours).

M.B., Ch.B.—C. A. Kilpatrick and Jean D. McMillan.

University of Dublin

On June 29th at Trinity College the honorary degree of M.Ch. was conferred on Lieut.-Colonel R. E. Wright, I.M.S.(retd.), hon. ophthalmic surgeon to the Hospital for Tropical Diseases. The following degrees were also conferred :—

M.D.—W. B. Roantree.

D.Sc.—W. R. Aykroyd, M.D.

M.B., B.Ch.—D. M. R. Barry, Deborah Bloom, T. W. Buckley, R. T. Burkitt, Mary C. Conlin, F. H. Counihan, Isabella M. Dorman, H. A. Dougan, Muriel Elliott, W. C. Good, E. W. R. Hackett, T. L. Lawson, C. M. Ludlow, W. W. McGrath, Brian Mayne, G. E. Nevill, S. G. O'Neill, M. F. X. Slattery, J. T. Speidel, G. D. Stevenson, J. C. de R. Sugars, D. B. Taylor, R. W. Temple, R. J. Grove-White, and Robert Wilson.

Queen's University, Belfast

At recent examinations the following candidates were successful :—

M.D.—Muriel J. L. Frazer and J. W. M'Fetters (with high commendation), G. F. T. Casement, S. L. W. Erskine, Leopold Herbert, and E. J. Sankeralli.

M.B., B.Ch., B.A.O.—Raymond Magill and William Townsley (second-class honours); G. F. Adams, J. R. Armstrong, H. W. C. Baillie, W. H. Braidwood, James Browne, John Bunting, J. O. Y. Cole, S. D. Corry, J. I. Cunningham, W. M. Davidson, D. M'L. Deeny, Stafford Dobbin, James Elliott, Jane M. Fullerton, Samuel Gibson, W. G. Gibson, John Gilmore, J. R. Graham, H. G. Greeves, A. T. Hawthorn, Rosetta Hill, S. A. C. Hunter, S. T. Irwin, W. B. James, W. R. Johnston, J. A. Lawrence, Joseph Lazarus, A. T. Linton, James M'Cabe, J. K. M'Cabe, H. A. M'Caffery, S. H. M'Caughey, Florence M. M'Clelland, Laurence M'Crory, E. M'F. M'Kee, Albert Maclaine, James M'Master, V. J. M'Veigh, L. F. M'Williams, James Mahood, J. A. Mark, Agnes J. A. Maybin, R. P. Maybin, C. W. Mearns, J. M'I. Megaw, R. A. Moorhead, W. M. Morgan, J. H. O'Connell, J. R. Roulston, H. E. Rutherford, J. P. Savage, W. F. Smyth, Vera M. Sterling, Muriel Sythe, James Taylor, F. G. C. Walker, H. H. Weir, R. I. Wilson, and R. J. Wright.

St. Andrews University

On June 30th the hon. degree of doctor of laws was conferred on Dr. E. D. Adrian, F.R.S., professor of physiology in the University of Cambridge.

Provisional Cancer Council in Ireland

Our Irish correspondent writes: The first meeting of the Provisional Cancer Council was held on June 29th at the office of the Minister for Local Government and Public Health, when the council was addressed by the Minister, Mr. Sean T. O'Kelly. The Minister said that the council owed its origin to a recommendation of the Hospitals Commission, and its immediate function would be: "To submit proposals for the provision, staffing, equipment, administration, and maintenance of a radio-therapeutic institute, having regard to the existing facilities, and in general to report on such aspects of the problem as the council should think fit." He drew attention to the increase in the death-rate from cancer. In 1911 the death-rate per thousand of the population was 0·78, and it had increased steadily from year to year until in 1937 it was 1·21 per thousand. Dr. P. MacCarvill, chairman of the council, thanked the Minister for attending to inaugurate the proceedings. He welcomed the use of the word "cancer" in the name of the council, as he thought there was no use in suppressing the term. Familiarity with the word would make the public realise that there was no stigma attached to it, and that it was not necessarily a harbinger of death. If early advice were sought, and early treatment instituted, the results would exceed anything now believed possible by the public. The country was late in undertaking cancer work, but there was a certain advantage in this as it could begin at the stage which other countries had now reached.

Anthropological Congress

The second International Congress for Anthropological and Ethnological Sciences will be held at Copenhagen from August 1st to 6th. Further information may be had from Dr. Kaj Birket-Smith at the University of Copenhagen.

Egyptian Decoration

The King has given Mr. Cecil P. G. Wakeley permission to wear the insignia of commander of the Order of the Nile, which has been conferred upon him by the King of Egypt.

Welsh Board of Health

Dr. T. W. Wade, the medical member of the board, presided over a dinner held in Cardiff on July 1st in celebration of the knighthood conferred on Mr. John Rowland, the chairman. In replying to the toast of his health, Mr. Rowland said that he wanted to make the board a living force in the life of Wales and to consolidate Wales as an entity in the United Kingdom.

Questionnaire on the Nursing Profession

The Inter-Departmental Committee on Nursing Services is issuing a questionnaire to all hospitals in the country with the object of ascertaining statistics on such matters as the hours nurses have to work, the salaries they receive, and the length of their annual holidays. Other matters which are dealt with in the questionnaire are the numbers of nurses of the various grades employed by each hospital, the arrangements which are in operation for the training of probationers, and the reasons which cause so many probationers to leave the nursing profession during their first years in the service.

Lectures on Retarded Children

A course of lectures and clinical instruction for medical practitioners on problems connected with retarded and difficult children has been arranged by the University of London Extension and Tutorial Classes Council in coöperation with the Central Association for Mental Welfare. The lectures will be held from Nov. 7th to 12th at the Senate House, W.C., and the speakers will include Mr. Cyril Burt, D.Sc., Miss Lucy Fildes, Ph.D., Dr. William Moodie, and Dr. A. F. Tredgold. Further information may be had from Miss Evelyn Fox, c/o University Extension Department, University of London, the Senate House, W.C.1.

Manchester Royal Infirmary

The board of governors of this hospital has launched an appeal for £200,000. The deficit on the last six years' working is over £108,000 and the reserve fund is now only about £13,000. The governors are already committed to complete the orthopædic department and to make additions to plant costing nearly £20,000. The department of neurology is urgently in need of funds. There has also been an increase of £35,000 in annual expenditure since 1930, while the annual income has only increased by £8000. Manchester Royal Infirmary was founded 186 years ago and is one of the largest teaching hospitals in the country, treating over 12,000 in-patients and over 57,000 out-patients last year.

THE LANCET 100 YEARS AGO

July 7th, 1838, *pp.* 524 *and* 528.

THE Cæsarean operation, as our readers well know, is seldom or never had recourse to in this country; in France the examples, though somewhat more numerous, are still excessively rare; while in Germany the operation is not only frequently performed, but attended with a remarkable degree of success.

* * * *

A STUDENT at the Westminster Hospital complains that the governors of that institution, notwithstanding the large sums paid by the pupils for admission within its walls, peremptorily refused the students permission to witness the procession at the coronation, from any part of the building, even from the roof. . . . The fact stands in disagreeable contrast with the liberality of the governors of St. George's Hospital, into which building the students were directed to be freely admitted on the occasion.

Medical Diary

July 11th to July 17th

SOCIETIES

PADDINGTON MEDICAL SOCIETY.
TUESDAY.—9 P.M. (Paddington Town Hall, Paddington Green, W.), Dr. N. W. Hammer, Dr. J. Nairn Dobbie, and Mr. E. W. Thorn Bannister: The Place of the Medical Practitioner in Air-raid Precautions Schemes.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY.—5 P.M. (West London Hospital, W.), annual general meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
FRIDAY.—5 P.M., Prof. Frank Mann (Mayo Foundation): The Mechanism of Peptic Ulceration with a Review of the Results of Experimental Investigations.

VICTOR HORSLEY LECTURE.
TUESDAY.—5 P.M. (University College Hospital medical school), Dr. Gordon Holmes, F.R.S.: The Cerebral Integration of the Ocular Movements.

ROYAL SANITARY INSTITUTE.
MONDAY to SATURDAY.—Health Congress at Portsmouth.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
TUESDAY.—4.30 P.M., Dr. M. Mitman: Modern Methods in Diagnosis and Treatment of (*a*) Whooping-cough, (*b*) Enteritis and Dysentery, (*c*) Cerebro-spinal Fever, (*d*) Acute Poliomyelitis.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical).
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. Wilfrid Sheldon: The Pneumonias of Childhood. 3 P.M., Dr. D. B. Bradshaw: Tuberculin Testing.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.
MONDAY.—5 P.M., Sir Frederick Hobday: Comparative Medicine.
THURSDAY.—5 P.M., Dr. Desmond Curran: psychiatric demonstration.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—ALL SAINTS' HOSPITAL, Australstreet, S.E., afternoon course in urology.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E., afternoon course in dermatology.—LONDON CHEST HOSPITAL, Victoria Park, E., Sat. and Sun. course in diseases of the heart and lungs.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Mr. Zachary Cope: demonstration of surgical cases.

Appointments

ANDREW, DOUGLAS, M.B. Brist., Radiologist to the Westminster Hospital.
BOWEN, J. G., M.B. Lond., F.R.C.S. Eng., Surgeon to the Accident and Surgical Hospital, Barry.
CARLETON, ALICE, M.A. Oxon., M.B. N.U.I., Dermatologist to the Radcliffe Infirmary, Oxford.
EVANS, T. P., M.R.C.S. Eng., Part-time Assistant Tuberculosis Officer for Southwark.
MURPHY, F. D., M.B. N.U.I., F.R.C.S. Eng., Deputy Medical Superintendent, Grade II, at Fulham Hospital (L.C.C.).
OSBORN, MURIEL M., M.R.C.S. Eng., Assistant Medical Officer of Health for Barking.
PEET, E. W., M.B. Durh., F.R.C.S. Eng., Surgical Registrar to the Ear, Nose, and Throat Department of the Radcliffe Infirmary, Oxford.
RIDDELL, V. H., M.A. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon to the Royal Waterloo Hospital.
ROSS, DAVID, M.B., F.R.F.P.S. Glasg., Assistant Physician at the Royal Mental Hospital, Aberdeen.
SEARLE, W. N., M.B. N.Z., F.R.C.S. Eng., M.C.O.G., Surgeon to the Chelsea Hospital for Women.
TREBLE, H. A., B.M. Oxon., M.R.C.P. Lond., Hon. Physician to the Kent and Canterbury Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. H. BROADBENT (Bridlington District, York, E.R.); Dr. J. D. ROBERTSON (Barnoldswick, York, W.R.); Dr. R. F. WINCKWORTH (Taunton, Somerset); Dr. C. R. MCCLURE (Hampstead, London).

Vacancies

For further information refer to the advertisement columns

Aberdeen University.—Lectureship in Anatomy, £450.
Ashton-under-Lyne, Lake Hosp. and Darnton House Institution.—Sen. Res. M.O., at rate of £300.
Ashton-under-Lyne District Infirmary.—Res. Surg. O., at rate of £200.
Bangor, Caernarvonshire and Anglesey Infirmary.—Sen. H.S., £170. Also Cas. O., at rate of £150.
Barking Borough.—Asst. M.O., £600.
Berkshire Mental Hosp., Wallingford.—Second Asst. M.O., £350.
Birmingham, Queen's Hosp.—Registrar to Ear, Nose, and Throat Dept., at rate of £150.
Birmingham, Romsley-hill Sanatorium.—Res. Asst. M.O., at rate of £240.
Blackburn and East Lancashire Royal Infirmary.—Res. Surg. O., £250.
Bolingbroke Hosp., Wandsworth Common, S.W.—H.P., at rate of £120.
Bolton Royal Infirmary.—H.S., £150.
Bradford Children's Hosp.—H.S., £150.
Braintree, Black Notley Sanatorium.—Second Asst. M.O., £350.
Brighton, New Sussex Hosp. for Women.—Hon. Ophth. Surgeon.
Bristol Royal Infirmary.—Sen. Cas. H.S. and Sen. Obstet. H.S., at rate of £150 and £100 respectively. Also H.P.'s and H.S.'s, each at rate of £80.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
Bury St. Edmunds, West Suffolk General Hosp.—H.P., at rate of £150.
Cardiff, King Edward VII Welsh National Memorial Association.—Asst. Res. M.O. for South Wales Sanatorium, £200.
Chester City Hosp.—Jun. Res. M.O., at rate of £150.
Chesterfield and North Derbyshire Royal Infirmary.—H.S. to Ophth., &c., Dept., at rate of £150.
Colchester, Essex County Hosp.—Asst. H.S., £126.
Connaught Hosp., Walthamstow, E.—Cas. O., at rate of £110.
Croydon, Mayday Hosp.—Jun. Asst. Res. M.O., £300.
Deal, Victoria Hosp.—Res. M.O., at rate of £150.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Dept., £150.
Durham County Council, &c.—District Tuber. M.O. and M.O.H., £800.
Durham County and Sunderland Eye Infirmary.—H.S., £350.
East Ham, Town Hall.—Locum Tenens, 10 guineas per week.
East Ham Memorial Hosp., Shrewsbury-road, E.—Hon. Gynæcologist.
Edinburgh Royal Infirmary.—Clin. Asst. to Eye Dept., £200.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.S., at rate of £120.
Glamorgan County Council.—Jun. M.O. for Hensol Castle Certified Institution, £350.
Glasgow, Hawkhead Mental Hosp.—Jun. Asst. M.O., £300.
Gloucester, Barnwood House Hosp., &c.—Second Asst. M.O., £500.
Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O., £200. Also Cas. O., at rate of £150.
Grimsby and District Hosp.—Res. Orthopædic Officer, £225. Also H.P., at rate of £150.
Halifax Royal Infirmary.—Third H.S., at rate of £150.
Hampshire County Council.—Asst. County M.O., £767.
Hampstead General Hosp., Haverstock-hill, N.W.—H.P. and H.S., each at rate of £100. Also Surg. to Out-patients.
Hertfordshire County Council.—Asst. M.O.H. for Maternity and Child Welfare, £500.
Hosp. for Tropical Diseases, Gordon-street, W.C.—H.P., at rate of £120.
Huddersfield Royal Infirmary.—H.P., at rate of £150.
Hull, Beverley-road Institution.—Asst. M.O., £350.
Keighley and District Victoria Hosp.—First and Second Res. M.O.'s, at rate of £160 and £120 respectively.
Kent and Canterbury Hosp.—H.P., at rate of £125.
King Edward Memorial Hosp., Ealing.—Cas. O. and Deputy Res. M.O., at rate of £225.
Lancashire Mental Deficiency Acts Committee.—Additional Asst. M.O., £600.
Lancaster Royal Infirmary.—H.S., at rate of £130.
Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O., at rate of £200.
Liverpool Hosp. for Consumption and Diseases of the Chest.—Res. M.O., £150.
Liverpool Sanatorium, Delamere Forest.—Asst. to Med. Supt., £225.
Liverpool University.—Lecturer in Dept. of Pathology, £600.
London Chest Hosp., Victoria Park, E.—H.P., at rate of £100.
London Hosp., E.—Medical First Asst. and Reg., £300. Also Medical Out-patients' First Asst., £150.
London Jewish Hosp., Stepney Green, E.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.
Manchester, Crumpsall Hosp.—Res. Surg. O., £400. Also Res. Asst. M.O., at rate of £250.
Manchester, Northern Hosp., Cheetham Hill-road.—Res. Surg. O., £150. Also Res. H.P. and Res. H.S., each at rate of £100.
Manchester City.—Asst. Tuber. O., £650.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Manchester Royal Infirmary.—Res. Registrar to Surg. Out-patient Dept., at rate of £150. Also three H.S.'s to Spec. Depts., four H.P.'s, and four H.S.'s, all at rate of £50.
Manchester Victoria Memorial Jewish Hosp., Cheetham.—Res. Surg. O., £250.
Müller General Hosp., Greenwich-road, S.E.—Anæsthetist, 52 guineas.
New Zealand Royal Society for the Health of Women and Children.—Medical Adviser to Dominion Council, £1200.
Newcastle-upon-Tyne, City and County.—Asst. Child Welfare M.O., £500.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Sen. Surg. O. to Leazes Hosp., £200. Also Radiographer, £5 per week.
North Middlesex County Hosp., Silver-street, N.—Asst. M.O. at rate of £350.
Nottingham General Hosp.—Res. Cas. O., at rate of £150.
Plymouth, Mount Gold Orthopædic Hosp.—Asst. Orthopædic Surgeon, £125.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—H.P. and H.S., each at rate of £120.
Preston, County Mental Hosp., Whittingham.—Sen. Asst. M.O., £700.
Preston, Sharoe Green Hosp.—Jun. Asst. Res. M.O., at rate of £100.
Preston, Whiston County Hosp., near Prescot.—Res. M.O., at rate of £350.
Preston and County of Lancaster Queen Victoria Infirmary.—H.S. to Consulting Surgeon and H.S. to Eye and Ear, Nose and Throat Dept., each at rate of £150.
Queen Mary's Hosp. for the East End, Stratford, E.—Clin. Asst. for Chronic Rheumatic Diseases.
Queen's Hosp. for Children, Hackney-road, E.—Vacancy in Dept. of Psychological Medicine, 1 guinea per session.
Reading, Battle Hosp.—Res. Asst. M.O., £300.
Reading, Royal Berkshire Hosp.—Res. Anæsthetist, at rate of £250.
Redhill County Hosp.—Res. Asst. M.O., at rate of £250.
Richmond, Surrey, Grove-road Institution.—Res. Asst. M.O., at rate of £250.
Rotherham Hosp.—Cas. H.S., £150.
Royal Air Force.—M.O.'s.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100. Also two Hon. Asst. Surgeons.
Royal National Orthopædic Hosp., 234, Great Portland-street, W.—Two H.S.'s, each at rate of £150.
Royal Naval Medical Service.—M.O.'s.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Hon. Asst. Physician.
St. Helens County Borough.—Asst. M.O.H., £500.
St. Mary's Hosp., W.—Cas. H.S., at rate of £100.
Salford, Hope Hosp.—Res. Obstet. Officer, £460.
Salford Royal Hosp.—Radiologist, £300.
Sheffield Royal Hosp.—Clin. Asst., £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. and Res. H.P., each at rate of £160.
Somerset County.—M.O.H. for Urban Districts of Frome, &c., £800.
Stoke-on-Trent, Longton Hosp.—H.S., at rate of £180.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Physicist to Radium and Deep X Ray Dept., £350.
Sunderland Royal Infirmary.—Asst. Pathologist, £400.
Truro, Royal Cornwall Infirmary.—H.S., £170.
University College Hosp. Medical School.—Radcliffe Crocker Travelling Scholarship in Dermatology, £280.
Ventnor, I. of W., Royal National Hosp. for Consumption.—Second Asst. Res. M.O., at rate of £200.
Victoria Hosp. for Children, Tite-street, Chelsea, S.W.—H.P. and H.S., each at rate of £100. Also Cas. O., at rate of £200.
Walsall General Hosp.—H.S., at rate of £150.
Warrington Infirmary and Dispensary.—Hon. Dermatologist.
Watford and District Peace Memorial Hosp.—H.S. and H.P., each at rate of £150.
West End Hosp. for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P., £125.
West End Hosp. for Nervous Diseases, 73, Welbeck-street, W.—Two Hon. Clin. Asst.s.
West London Hosp., Hammersmith, W.—Hon. Physician for Psychological Medicine.
Wolverhampton Royal Hosp.—H.S., at rate of £100.
Worcester County and City Mental Hosp., Powick.—Asst. M.O., £350.
York, The Retreat.—Med. Supt., £1000.

Births, Marriages, and Deaths

BIRTHS

FERGUSSON.—On June 30th, the wife of Dr. Alec Fergusson, Westcliff-on-Sea—twin son and daughter.
GILPIN.—On June 28th, at King's College Hospital, the wife of Dr. A. Gilpin—a son.
HICKS.—On June 26th, at Birmingham, the wife of Dr. Charles Hicks—a son.
MACLEOD.—On July 1st, at Downshire Hill, N.W., the wife of Mr. Cameron MacLeod, F.R.C.S.—a daughter.
RAWKINS.—On July 2nd, the wife of Dr. M. D. Rawkins, of Twickenham—a son.

MARRIAGES

CAMPBELL-FERGUSON—MILLAR.—On July 2nd, at All Saints' Church, Darton, Charles Hugh Campbell-Ferguson, M.A., M.B. Camb., to Margaret Ethel, elder daughter of Dr. and Mrs. Ramsay Millar, of Darton Hall, Yorkshire.

DEATHS

JEFFREE.—On June 28th, at Merstham, Surrey, Frank Jeffree, M.D. Durh., aged 75.
WOODS.—On July 3rd, at Blindley Heath, Lingfield, Surrey, Hugh Woods, M.D. Dubl., Vice-President, London and Counties Medical Protection Society, in his 80th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

STAMMER

By E. N. SNOWDEN, M.B. Lond.

PSYCHOLOGIST TO THE MAIDA VALE HOSPITAL FOR NERVOUS DISEASES; LATE CHIEF ASSISTANT, DEPARTMENT OF PSYCHOLOGICAL MEDICINE, ST. BARTHOLOMEW'S HOSPITAL

STAMMER is perhaps the most painful of that class of infirmities which do not produce disablement. Shyness and self-consciousness, a mild phobia, or even a simple anxiety neurosis can be hidden from other people and the sufferer can pass as an ordinary individual, but stammer shows itself in every conversation. The stammerer, moreover, gets very little sympathy—his efforts to speak may even cause amusement or derision—and he is conscious that his struggles with a word which the context has already made obvious are a source of agony to the sympathetic listener. Speech is such a very essential part of life. There is no way of escaping from the necessity for using it, and a man robbed of fluent speech loses a valuable aid to thought and judgment, that of giving expression to an idea and seeing how it sounds.

The nature of the speech process makes it easy to understand why the consciousness of stammer increases the disability. This consciousness separates the patient from other people, and for any herd animal to be different from the rest of the herd always produces a feeling of fear. This is fundamental for all animals who live in communities, where to be different is to invite ill-treatment. Among civilised human tribes that of the junior school is one of the most primitive, and there the unfortunate child who is different is either bullied or ignored.

ITS ORIGIN

How does the condition arise? To answer this question it is first necessary to understand the normal process of speech. Speech is intended to convey to others what is happening to the individual. It varies in tone and volume from the cry of rage or fear or the gentle tones of the contented animal to the complicated speech of the educated man, and each variation has the same purpose in view: to indicate the thoughts and feelings of the speaker.

The development of speech in the child follows the path by which these sounds have developed during the history of the human race, and like so many of the changes through which the infant must pass those of developing speech must be crowded into a short space of time. To this end all the faculties needed for the process develop together—namely, the capacity for ideas which need expression, the association fibres in the brain, the speech centre, and the control of the muscles involved in the mechanism of turning sound into speech. It is a complicated process, but in the normal child living a happy, undisturbed life it all works together easily enough. There is usually a period when the ideas of an active-minded child outpace the developing faculty of speech, just as the wish to run out-distances the coördination of the muscles of locomotion, but this soon adjusts itself so that the child can run without stumbling, and in a similar way the faculty of speech becomes firmly established.

The mechanism of speech involves three main physical structures: (1) the diaphragm; (2) the vocal cords with their controlling muscles; and (3) the articulation, involving mainly the palate, tongue, teeth, and lips. A current of air caused by the relaxation of the diaphragm passes over the vocal cords, which are thus caused to vibrate and to produce sound. The sound is then altered by the articulation system to produce the various modifications which constitute speech. This process comes under the category of fine movements and, like the fine movements of the hand and arm such as those used for writing, requires that the muscles not engaged in the task shall be relaxed. The movements of the muscles of speech, and particularly of the diaphragm, are perhaps the most delicate of which the human muscles are capable. As an example it is only necessary to consider the trained voice of an opera singer to realise the fineness of movement that can be attained. A long phrase of an aria, requiring the singing of the notes and of the words, the conveying of their meaning, and the variations of volume, can all be accomplished within the compass of a single breath. Any condition of the body which interferes with the perfect control of the muscles will therefore interfere with the process of speech, and it becomes clear that for speech to be perfect there must be complete mental and physical composure.

Emotional states, particularly a state of fear, and including all the variations of that state, such as anxiety, apprehension, and nervous anticipation, will prevent clear speaking because of the increased muscular tension which is a part of all such conditions. It is easy to observe the interference with the other fine movements, such as writing, produced by emotion, but as the diaphragm and the muscles controlling the vocal cords are hidden from sight the part played by the increased tone of these muscles in speech defects tends to be overlooked by the patient. Nor is it necessary for the degree of emotion to be very great, the finer the movement of the muscles that is needed the more easily can the movement be disturbed, so that interference with speech is one of the first signs of the lesser degrees of emotion. The fact that the tones of the voice in strong emotion tend to be high pitched and explosive is evidence that the vocal cords are tense, and that the diaphragm is out of complete control.

Stammer differs from the ordinary interference with speech by emotion in being always present. It appears to be a fact that the habitual stammerer is always in a state of apprehension, but apart from this there is a habit of forcing, or attempting to force, the diaphragm to obey the will to speak, which goes back to the time when the stammer first appeared and is usually the result of the well-meant endeavours of older people to encourage correct speaking. This encouragement, often forceful in nature, is a mistake. The stammering child is already trying its hardest to speak correctly and if left to itself will often succeed, but once the habit of forcing the diaphragm is formed stammer is established.

With the above considerations in mind it is possible to answer the question why people stammer. Stammer appears to arise generally in an emotional state, usually a state of fear in some degree, or in anxiety resulting from some form of repression. The interference with the diaphragm which results from the accompanying muscle hypertension prevents fluent speech. This is followed by an attempt to force the diaphragm into movement so that it becomes locked and rigid, and speech is completely checked until the diaphragm relaxes and air passes over the vocal cords once more. Once this becomes a fixed

habit every kind of trick is used to circumvent the difficulty caused by the locked diaphragm—a jerk of the head or arm or a convulsive movement of the body to start the muscles into action, a whistle or wordless sound to help the diaphragm to move.

Certain sounds, usually labials or dentals, become associated with the stammer, and as these are approached in speech or reading aloud, fear is evoked and the stammer state begins. The lips or tongue continue to form the sound while the passage of air over the vocal cords is stopped, then another sound is substituted without effect and the meaningless sounds are produced which characteristically accompany the stammer. The trick of paraphrase will often help by substituting other words in conversation for those that cause fear, but this is simply a palliative. It cannot be of any help when reading aloud, unless it is a carefully prepared speech, and the constant awareness of speech defect and the strain of constantly changing the phrase have a bad effect on the nervous condition of those who practise this method. Overflow of nervous energy to the muscles of the face and arms (the muscles of expression) is another result of the effort to force the diaphragm to work, and this produces grimaces and convulsive movements.

Summing up what has been said it appears that a condition of fear or anxiety produces the original difficulty with speech by causing hypertension of the diaphragm and preventing free passage of air over the vocal cords. The patient then tries to force the diaphragm to work by an effort of will, which increases the activity of the motor area of the brain corresponding to the muscles of speech. The effect of this is to lock the diaphragm and to produce overflow of energy into the other muscles of speech and of expression. Secondary anxieties are then developed which cause a similar state in mildly emotional situations and when approaching certain sounds which the patient has come to dread, and finally certain tricks and devices, the original purpose of which was to release the diaphragm, become fixed habits, adding to the consciousness by the patient of peculiarity and increasing the secondary anxieties.

The types in which stammer occurs are :—

(1) The frightened child.
(2) The child with some disturbing complex.
(3) The child who imitates a stammering grown-up.

To these must be added two special types, which come under the category of the frightened child, and in which there is an attempt to force speech before the speech centre and the association fibres are fully developed. These are :—

(4) The normally left-handed child who is forced to write and do fine movements with the right hand. This obliges the child to develop a fresh centre for fine movement on the left side of the brain, and produces a delay in development of both writing and speech.

(5) The younger of two children debarred from association with other children of corresponding age, where the elder child tries to make an adequate playmate of the younger, and where competition between the children is keen.

A good example of the effect of attempting to force speech is to be found in those cases in which stammer followed the functional symptom of mutism in soldiers suffering from the strain of war. When these cases were allowed to rest and recover the power of normal speech was readily restored, but if any forcible or painful means was employed to make them speak stammer invariably followed.

ITS TREATMENT

The essential factor to be kept in mind, if treatment is to be successful, is that all cases of stammer are primarily emotional, and that the first part of the treatment must be psychotherapeutic. It has long been recognised by those who treat these cases without the aid of psychotherapy that the diaphragm is chiefly at fault, and their treatment is aimed at relaxing the diaphragm and removing the bad habits of articulation. When this is successful, all that it can attain is a formal, laboured utterance, quite different from normal free speech, and the patient is for ever conscious of the effort required to practise the correct rules of breathing and so on that he has learnt by tiresome exercises. Any situation tending to disturb his emotional balance usually involves a return of the stammer, and the concentration on the way he is speaking interferes with the free flow of thought by occupying consciousness at a time when it should be free to develop his ideas and to clothe them in suitable language.

In the psychological part of the treatment in the great majority of cases no very profound examination of the patient's mind is required. The history of the case will usually disclose a period of nervous tension just previous to the onset of the stammer. Differences between the parents and especially noisy quarrels appear to be a frequent factor in its production, and another frequent cause is the first period of school life in a child who has not been trained to withstand the strain of individual life, unprotected by reassuring parents or nurses. These and similar causes are usually readily discovered. In young people they are important, and care must be taken to alter the conditions as far as possible, to relieve the anxiety, and so reduce the emotional strain. In cases where the onset of the stammer is recent this change of conditions may be all that is necessary to restore fluent speech. If the history of the case suggests that some disturbing complex is the basis of the condition, a much more complete examination of the patient is necessary, but in practice this is uncommon and any form of analysis is rarely required.

In older people, where the stammer has been established for many years, it is only necessary to place on record the original cause as a part of the process of explaining to the patient how and why he stammers. The strain has disappeared out of the patient's life and only the effect remains.

The patient must be convinced that speech is a natural and easy process requiring no more conscious effort than walking. The whole process of speech and the reasons why emotion disturbs its free flow must be explained in terms that the patient can understand, so that the attention is concentrated not upon the articulation or the diaphragm but upon the understanding and control of the emotional states that produce the stammer.

Most stammerers can, in certain circumstances, speak quite fluently, and speaking in these conditions should form a basis from which natural speech in all circumstances can be developed. Only in this way can the correct degree of self-confidence be attained, for it is the production of confidence and self-assurance which is the aim of the whole process of treatment.

The above general outline can now be considered in some detail, but it must be kept in mind that, in a condition so individual as stammer, where each case must be approached in the way best suited to the character and condition of the patient, no hard and fast rules can be given. The following details are therefore offered as a guide, to indicate the manner

in which a case of stammer can be approached, and to assist in the conduct of the case.

The history of the case should be as complete as possible. It should include inquiry about any grown-up stammerer encountered during childhood, and about any unhappiness in early years from differences between the parents or other cause. If the patient is left handed, was he taught to write with the right hand? Evidence of any backwardness compared with companions, either older or of his own age, must be looked for, especially if this comparison involved speech. Early school days should be examined for evidence of unhappiness due either to the actual school conditions or to the patient's inability to adjust himself to ordinary school life. In particular it is necessary to investigate carefully the conditions existing just before the onset of stammer, and to find whether the stammer was more evident with certain people, such as father, mother, or school teacher.

The advantage of using the explanatory method of treatment is clearly seen in cases of stammer. The process of the production of the speech defect is described in detail, and in words that the patient can understand, and once he understands the process, his coöperation is gained, and he is usually able to supplement the first history with new evidence bearing on the cause of the condition. In this way the originating emotional state gradually becomes clear to both the practitioner and the patient. It is comforting to the patient to realise that he is dealing with a natural condition of cause and effect, instead of helplessly struggling, as he has previously done, with a visitation over which he has no control.

It is not possible in a short paper to deal with the primary anxieties that may be an originating cause of the stammer, especially when this arises in adult life. These primary anxieties frequently come to light while taking the patient's history, and they must be treated according to the psychotherapeutic technique favoured by the practitioner. The method of explanation and re-education will be found the most practical in nearly every case. It is rapid and effective, and it is permanent because when the patient understands the underlying cause of the illness he conducts the chief part of the re-education himself, and he is able to deal immediately with the cause if his symptoms show any tendency to reappear. By this means also secondary anxieties, caused by the anxiety symptoms themselves, are prevented.

Turning now to the stammer symptom two main points require attention. These are (1) changing the habit paths which have become established, and (2) restoring lost confidence and removing self-consciousness. It must be realised that the process of cure will take time. Habit is a persistent thing. The intention of habit, whether it is a habit of thought only or one involving action is to relieve the conscious mind of constant effort, and to keep consciousness clear for the reception of ideas and the perception of outside influences. So large a part does it play in our lives that a small thing in constant use which is moved from its usual position will be a source of disturbance to our conscious mind until it is put back in its right place, and a sore spot on a finger, because it interferes with the habitual use of the hand, is almost as disturbing as an arm in a sling.

The mechanism of habit is outside consciousness, and new habit paths can only be formed through conscious effort. The stammerer has two forms of habit to overcome: the mental habit formed by comparing himself with those who can speak fluently and the physical habits of wrong use of the movements involved in speech. It is removing these habits which takes so long. These two forms of habit must be dealt with side by side so that by the time the patient's speech defect is cured he has already altered his habit attitude to the world.

When the examination and the preliminary explanation have been completed, the patient should have acquired two valuable aids towards cure—an expectant and receptive attitude towards the treatment and a feeling of composure and self-confidence in the presence of the physician. In this atmosphere the actual treatment of the speech defect can be begun.

It has been mentioned above that in practically all cases of stammer there are some conditions in which the patient can speak quite easily and naturally. This may be in his own family life, or when he is alone and talking to himself, or in the composed atmosphere of the consulting-room. This freedom of speech when present can be used as a foundation upon which to build free speech in all conditions. When this basis on which to begin work is not available, recourse must be had to changing the patient's personality until the first stages of easy and habitual speaking are established. This can be done by making him take the part of a character in a play (Shakespeare is particularly useful since the characters are so far removed from modern life) or read a passage from the Bible or from a poem which interests him. The effect of this is to take the patient out of himself so that he loses his self-consciousness. While he concentrates on the effect he is trying to produce he finds himself speaking fluently and naturally, and the belief that he is capable of natural speech is not shaken by subsequent stammering. Any embarrassment caused by hearing his own voice in the presence of the physician is removed by the realisation that both are working for the same end. The first efforts to speak should be low in tone and should convey the idea of composure, while the patient sits, completely relaxed, in a comfortable chair. As the treatment proceeds the voice can gradually be raised, and finally the words can be declaimed with vigorous emphasis. The patient gains confidence by hearing his own raised voice and by the fact that he is speaking naturally.

So far the patient has been speaking words that are not his own, and the next phase should be the easy use of his own language. This should begin with reading aloud a short essay or speech on a subject with which the patient is familiar, the idea being kept in mind that the patient is not concentrating upon speech but upon conveying information to the physician. Here again the patient should begin in a relaxed posture and in a low voice, and end by declaming as if to a large audience. Reading is followed by extempore speech on the same lines.

The patient should at this stage have attained complete confidence in his ability to speak easily and naturally, and he will usually report that his speech outside the consulting-room is showing signs of improvement. Psychological re-education should go on at the same time so that the effect of underlying anxiety on the diaphragm and other muscles will not check the patient's growing confidence.

In the last stage the patient must undertake phrases involving sounds that have induced fear in the past and have been habitually avoided, and must persevere with them until these fears are overcome and the task of reading any words can be approached with confidence. This should be followed by the practice of taking every opportunity for speaking in public. It will be found that the patient

has by this means discovered a new personality and is able to live his life with greater enjoyment and success.

In this treatment both the patient and the physician must exercise patience, and must be prepared for relapses into the old habits in emotional circumstances. Each set-back is of value in treatment. Its cause must at once be sought and agreed upon, and the circumstances which produced the failure must be repeated so that the emotion may be overcome and the tendency to stammer removed. Very soon the patient learns to carry out this process for himself, and eventually is conducting his own re-education.

"THIS MORTAL COIL"

LAST week, taking This Mortal Coil as a text for a discourse on the human skin, Dr. Leonard Williams developed his theme with characteristic phantasy and wit. He switched from one unexpected point to another before the full meaning of any allusion could be grasped, and used his tantalising skill sometimes as an enzyme to set his listeners foaming and fermenting and sometimes as a catalyst. The occasion was the thirteenth Macalister memorial lecture which he delivered at the National Temperance Hospital on June 30th, Major Richard Rigg presiding. Dr. Williams elaborated first the thesis that in the processes of evolution pigment as well as hair acts as a protective mechanism against the elements. From the blonds of the northern latitudes to the blacks of the equatorial regions skin pigment increases. On the basis that a practical ruling nearly always embodies a truth, he recalled how the French refuse the blond for tropical service lest he should fail to develop pigment and fall victim to disease, while they accept the darker brother with his capacity for colour adjustment against the sun's rays. The developing of colour in the skin seems to demand a physiological expenditure not lightly undertaken by nature. The black races are at their best in a tropical country; in a white man's land they are unhealthy. Next in importance to the attributes of colour came the attributes of odour. Dr. Williams spoke of the influence exercised by unclassified odours upon the life of each one of us, for "scent is stronger than sight or sound to make your heart-strings crack." The odours of the skin in man were regulated to some extent by diet.

A survey of the skin as a heat-regulating mechanism led to consideration of its power to strengthen and support muscle and organs, its impermeability to water and gas, and its resistance to invasion of the body by micro-organisms. Dr. Leonard Williams quoted the apt words of Alexis Carrel: "its external face is exposed to light, humidity, dryness, heat and cold, while its internal face is in contact with an aquatic world, warm and deprived of light, where the cells live like marine animals." Dealing with the skin's function of carrying stimuli to the central nervous system, where, interpreted, they resulted in action, he showed pain as protective in its nature, and as a function of the intelligence. In conclusion he described the skin of the face falling into fold and furrow, and graved as the years pass by the lines of character and of experience, whether good or ill. He who runs may read how the hoof-slide is scarred in the course.

PATHOLOGICAL INVESTIGATIONS AT THE LONDON CHEST HOSPITAL

THE routine pathological examinations, over 16,000 in number, carried out at the pathological laboratories, the gift of the Prudential Assurance Company, of the London Chest Hospital, Victoria Park, during 1937 did not prevent Dr. S. R. Gloyne and his colleagues from making full use of the opportunities for investigation which these laboratories afford. In the annual report, besides the classification of the routine tests, are reprints of articles from various journals. Dr. Gloyne gives an excellent summary of the cytology of sputum, which he rightly describes as a much-neglected subject. He shows that with proper technique, the examination of the cellular content of sputum can yield most useful information and he notes especially the value and limitations of such examinations in the diagnosis of some cases of carcinoma. An analysis of the autopsy records at Victoria Park for the last 16 years by Dr. Gloyne and Dr. C. Shiskin appears to support the suggestion that mitral stenosis is in some degree inimical to pulmonary tuberculosis, and the possibility that this may be due to alteration in the hæmo-respiratory exchange has been studied. Dr. R. Davies has investigated the influence of iron on the growth of the tubercle bacillus and concludes that small amounts of iron favour while larger amounts inhibit its growth.

THE HISTORY OF ST. HELENA

THOSE who think of St. Helena merely as the island-prison of Napoleon and nothing more may be surprised to learn that its authentic history covers a period of 436 years. Lying in the South Atlantic, in the direct route between the Cape of Good Hope and Cape Verde, its importance as a replenishing-station for ships was recognised by the Portuguese as early as 1502. By the beginning of the seventeenth century the Dutch and English had ousted the Portuguese and strove mutually to possess the island, which in 1657 was taken over by the English East India Company. In 1673 it was captured by the Dutch but, retaken within six months, it has remained a British colony ever since. In Dr. Gosse's richly entertaining history,[1] full of tales of adventure, mutiny, and war in the days when war was fun, it will be seen that St. Helena has had its share of good and bad governors and more than its share of queer parsons. No less queer were some of the Company's medical officers. Thus Dr. Du Nay, though a "well-qualified, sober man with a good judgment in his business," was unduly concerned about his own health and took at least a gallon of blood a week from himself. What was more, he used to faint at the sight of pork which was a staple article of diet at the Fort. Another practitioner, one Dr. Hicks, was brought before the governor's court in 1719 "for being drunk and breaking the peace in the street with his sword drawn; fined, and his sword ordered to be sold for the use of the guard"—which windfall, as Dr. Gosse ironically observes, was no doubt spent on rum punch.

CORRIGENDA

COÖPERATION WITHIN THE PROFESSION.—We regret that our brief summary of Dr. W. Allen Daley's contribution to this discussion (*Lancet*, July 2nd, pp. 39–40) misinterpreted its import. He was not speaking about the national maternity service but only about the domiciliary midwifery service instituted by the London County Council. He explained that the list of medical practitioners whose aid might be invited by midwives was not an "approved list," such as the Council had in mind, but a list of all practitioners willing to serve. The use of the list is still under consideration by the Council and he expressed no opinion about it.

M. & B. 693 IN PNEUMONIA.—In the paper by Dr. Evans and Dr. Gaisford in our last issue it is stated that typing of the pneumococcus from the sputum "was attempted in all cases in which sputum was available." This sentence was incorrectly worded owing to a misunderstanding. The authors inform us that in the early stages of the investigation, when pressure of routine work was heavy, there were some cases in which typing was not attempted at all. Under the heading Details of the Eight Fatal Cases the meaning will be clearer if the second sentence reads: "*The other 2 cases* were given the larger doses at present considered to be adequate."

[1] St. Helena, 1502–1938. By Philip Gosse. London: Cassell and Company. 1938. Pp. 447. 15*s*.